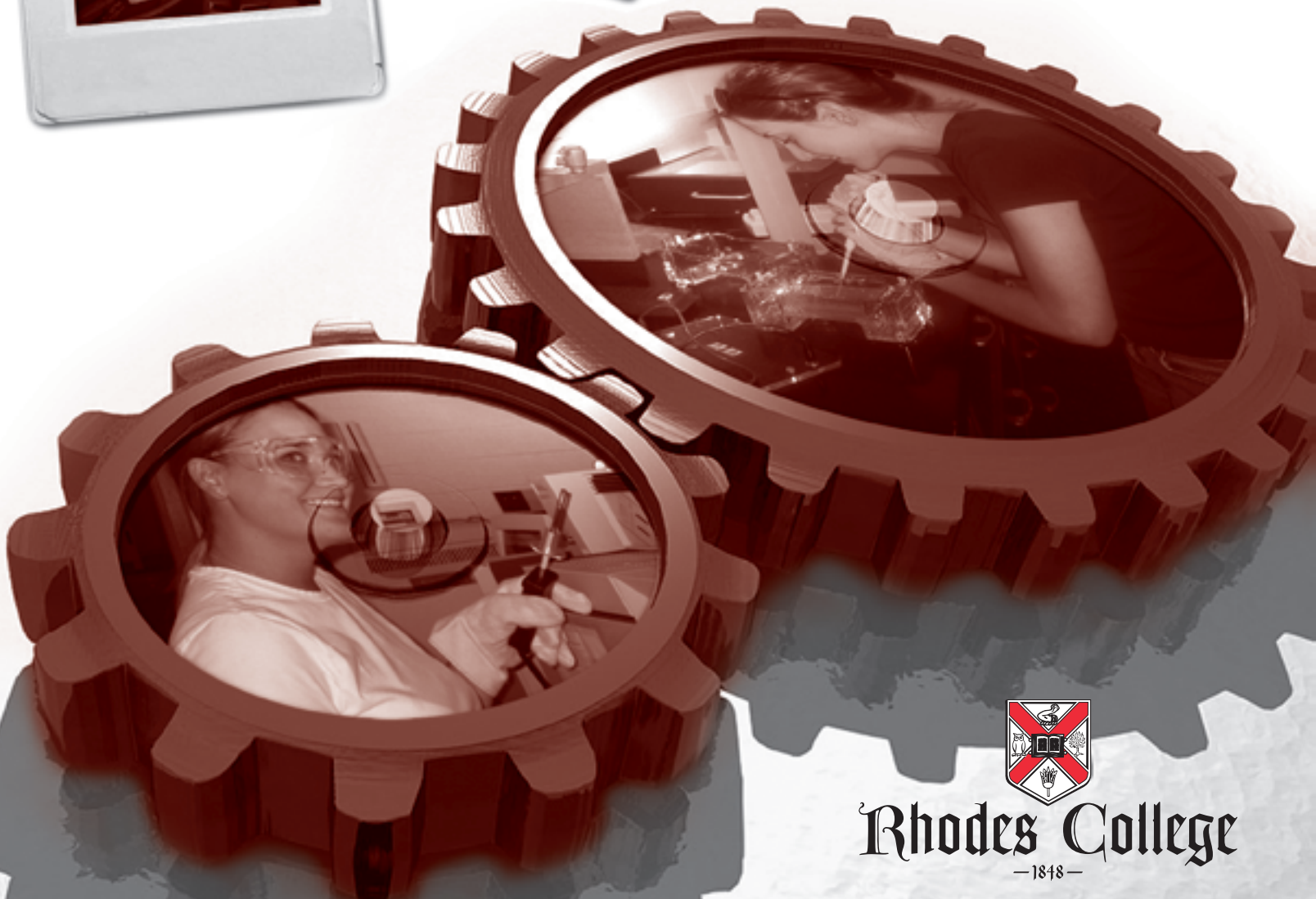


# Undergraduate Research and Creative Activity Symposium

APRIL 29, 2005  
MEMPHIS, TENNESSEE



Rhodes College

—1848—

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### **Symposium Planning Committee 2005**

Courtenay Harter (Fine Arts)  
Eric Henager (Humanities)  
Chris Mouron (Natural Sciences)  
Thomas McGowan (Social Sciences)  
Richard Redfearn (Chair, Natural Sciences)  
Katie Jameson (Student Representative)  
Sonia Singh (Student Representative)

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**Abbreviated Schedule (see the “Symposium at a Glance” grid, p. 3):**

**Plenary Lecture: Thursday, April 28**

**Dr. Mary Sue Morrow, Professor of Musicology at the University of Cincinnati’s College-Conservatory of Music**

**B.A. Music History, Rhodes College (Southwestern at Memphis), 1975; M.M. Music History, Northwestern University, 1976; Ph.D. Musicology, Indiana University, 1984**

*Reception: Rhea Lounge      6:30 pm*

*Lecture: Orgill Room      7:15-8:15 pm*

**“Writing the History of the Eighteenth-Century Symphony, or the Beethoven Effect”**

Ludwig van Beethoven has achieved a status in western culture unmatched by any other classical music composer. Beethoven the heaven-storming Titan, Beethoven the champion of freedom and the foe of tyrants, Beethoven the towering genius who triumphed over adversity, Beethoven the composer of symphonies that changed the course of western music—not only did this Beethoven make an indelible impact on nineteenth-century music, he entered into popular consciousness and remains a widely-recognized cultural icon even in the twenty-first century. But why Beethoven? This lecture will explore some of the circumstances that propelled him to iconic status and will examine the effect that his status and his music have had on the writing of the history of the symphony.

**Friday, April 29: during our Symposium – a community lunch**

*Enjoy a “Ratnic” lunch with our community of scholars, on the main quad. Rain location: Burrow Refectory)*

**Student Presentation Sessions (see the “Symposium at a Glance” grid, p. 3):**

*10:20 am-12:00 noon, various locations on the Rhodes campus*

*1:00-4:00 pm, various locations on the Rhodes campus*

**Closing Reception and Announcement of Outstanding Presentation Awards:**

*4:30-5:15 pm, Frazier Jelke Amphitheatre  
(Rain location: Hardie Auditorium)*

**Concert by Rhodes Orchestra, Rhodes Women’s Chorus, and Rhodes Wind Ensemble:**

*7:00 pm, Evergreen Presbyterian Church*

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**Symposium at a Glance: for Friday, April 29, 2005**

**F = Fine Arts    H = Humanities    N = Natural Sciences    S= Social Sciences**

Event:	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00
<b>Awards Convocation</b>	Hardie Auditorium			<b>R</b>								
<b>F Oral Session 1</b>		Fine Arts	Location F 10:40-12:00	<b>A</b>								
<b>F Oral Session 2</b>				<b>T</b>	Location 1:00-3:40 end	<b>F</b>		Fine Arts				
<b>H Oral Session 1</b>				<b>N</b>	108 Buckman 1:00-3:40	<b>H</b>		Humanities				
<b>H Oral Session 2</b>				<b>I</b>	110 Buckman 1:00-4:00	<b>H</b>		Humanities				
<b>H Poster Session</b>				<b>C</b>	Buckman Foyer 1:00-4:00	<b>H</b>		Humanities				
<b>N Oral Session 1</b>		Natural Sciences	225 Ohlendorf 10:40-12:00	<b>N</b>								
<b>N Oral Session 2</b>					Frazier Jelke B 1:00-3:40	<b>N</b>		Natural Sciences				
<b>N Oral Session 3</b>				<b>L</b>	Frazier Jelke A 1:00-3:40	<b>N</b>		Natural Sciences				
<b>S Oral Session 1</b>	Social Sciences		302 Clough 10:20-12:20	<b>S</b>	<b>U</b>							
<b>S Oral Session 2</b>	Social Sciences		102 Clough 10:20-12:00	<b>S</b>	<b>N</b>							
<b>S Oral Session 3</b>				<b>C</b>	102 Clough 1:00-4:00	<b>S</b>		Social Sciences				
<b>S Oral Session 4</b>				<b>H</b>	302 Clough 1:00-4:00	<b>S</b>		Social Sciences				
<b>N Poster Session (*)</b>					Frazier Jelke Lobby 1:00-3:00 (*)	<b>N</b>		Natural Sciences				
<b>S Poster Session (*)</b>					Frazier Jelke Lobby 2:00-4:00 (*)	<b>S</b>		Social Sciences				
<b>“Special” Sessions</b>					Urban Studies Charrette – Orgill Room, 12:00-1:00 (See key for other “special” sessions, below)	<b>N, S</b>						
<b>Closing Reception</b>								Amphitheatre 4:30-5:15				
<b>Rhodes Orchestra Concert</b>											Evergreen Presbyterian Church 7:00 start	

(\*) Natural Sciences and Social Sciences posters will be on display from 1:00-4:00.

**Special Sessions key:**

- Molecular Biology: Bioinformatics Poster Session – Frazier Jelke Lobby, 1:15-2:30 pm
- Animal Behavior “Mini Symposium” – Frazier Jelke C, 1:00-3:55 pm
- Environmental Research: Cypress Creek Oral Session – 410 Rhodes Tower, 1:00-3:40 pm
- SWEEP events – Frazier Jelke Lobby & Amphitheatre, 2:30-4:00 pm
- Biology II Laboratory Research – Frazier Jelke 141w and 143w, 1:15-2:45 pm

**Fine Arts Oral Presentations–Session 1**

***417 Clough, beginning at 10:40 a.m. until 12:00 noon***

***Session Chair: Hamlett Dobbins, Department of Art***

**10:40-11:00 The Adventures and Travelings of Jenny Rogers**

Jenny Rogers

Faculty Mentor: Hamlett Dobbins

Department of Art

Making maps has been a way for me to figure out, literally and figuratively, where I have been and where I am going artistically. Projects include an atlas, a personal chronology, a project in which I send people treasure maps in the mail that will lead them to a buried treasure that I have selected for them individually as well as other projects. I am interested in art that allows the "average" person to participate in or to be touched by.

My presentation will highlight my process—the influences that I draw on, how I figure out what kind of work to make, and how I actually make it—as well as images from my actual work. My presentation will clear up some of the perceived “mystery” of how artists work and showcase some of my art that is more “accessible” to non-artists, either because the work is about something they can relate to or because its work that “regular” people participated in.

**11:00-11:20 Averaging the Body**

Molly Chapman

Faculty Mentor: Erin Harmon

Department of Art

My artwork has, for the most part, always dealt with the body in some fashion. I am primarily a photographer, but only discovered this in my college years. After moving to Memphis, I became more aware than ever that my race and economic standing played a key part in my identity and the guilt and frustration I felt was something I wanted to explore. I have generally made quiet works of art having to do with the surface of the body. As a member of the majority, I feel I am not represented because I am accepted as the norm and therefore am not allowed to proclaim my individuality. Therefore, my most recent work deals with this blending in and lack of attention, or conversely, the fatal attempt to claim that attention. The greatest alteration for this semester’s work has been the drastic change in process and media. Instead of simply documenting my subject matter with traditionally fine art media, I am now using those materials themselves. I feel my work should be made and considered in a sociological context.

**11:20-11:40 I am Still Far Too Young To Understand the Blues**

Philip A. Kovacic

Faculty Mentor: Hamlett Dobbins

Department of Art

In an effort to better understand my self-discovery through art, it is ideal to utilize my current topic of interest as the immediate and fundamental basis for the depiction of this discovery. It has been the goal of this year’s study to focus on music and its correlation with art and its many mediums. The presentation will focus on what music has enabled me to accomplish not only in my own art, but also in projects done in collaboration with the general public. Drawing inspiration from a variety of sources has helped me more firmly visualize and establish the intense connection I have with music and art. With the ability to transcend simple album artwork, I feel that my work captivates the viewer into not only questioning my interpretations, but also developing their own.

11:40-12:00 **Cultural Crossroads**

Leila Mahfooz

Faculty Mentor: Erin Harmon

Department of Art

I left home to see the world, experience new things, to open my mind and learn about other cultures. However while living in the United States I learnt my most valuable lesson which is to appreciate my own culture, one that I had been brought up in and have taken for granted. My art work is informed by my experiences as a young Pakistani woman living in the United States, absorbing the local culture and reflecting upon the pros and cons of my own culture; it is a way of dealing with who I am and what I am evolving into. I use the *Burqa* (veil) and Islamic architecture and patterns as symbols of my culture and have explored literally and metaphorically the varied connotations these images carry in two different cultures. I am trying to find a way to dispel stereotypes and preconceived notions about my culture through visual seduction, and space manipulation.

**Fine Arts Oral Presentations–Session 2**

***417 Clough, beginning at 1:00 p.m. until 3:40 p.m.***

***Session Chairs: Victor Coonin<sup>1</sup> and Timothy Watkins<sup>2</sup>, Departments of Art<sup>1</sup> and Music<sup>2</sup>***

1:00-1:20 **Trompe L’oeil: Deceptions of the Eye and Mind**

Jacqueline Perrottet

Faculty Mentor: Victor Coonin

Department of Art

Throughout history the role of art, specifically painting, has been both an imitation of what surrounds us, and a form expression. The *trompe l’oeil* technique, a French word meaning to “deceive the eye,” is to be considered in this context. The use of *trompe l’oeil* to display random arrays of objects and collections within a niche or cabinet became a popular Dutch technique in the seventeenth to eighteenth centuries. Scholars particularly admire Domenico Remps’, *Cabinet of Curiosities* for its “deceptive” qualities and use of the *trompe l’oeil* technique, yet it is always discussed in the same context as other *Cabinet of Curiosities* from the early eighteenth century Dutch genre. If one tries to separate this work from its contemporaries, however, I believe that it is neither a piece of “trickery,” nor an attempt to document the collection of objects of Prince Ferdinando, the initial owner of the painting. I suggest that Remps’ *Cabinet* goes beyond the mere representation of the physicality of life and our surroundings, and depicts physical, psychological, religious, and philosophical themes; in particular the ephemeral nature of existence. Remps achieves this complex interrelationship of ideas by creating an overarching theme as he juxtaposes the characteristics of life with the evolving states of being over time. This is shown through dichotomies and hierarchies that are set up by the placement of the objects on the vertical and horizontal axes.

1:20-1:40 **The Development of 16<sup>th</sup> Century Instrumental Music as seen in Luys de Narváez’s “La Cancion del Emperador”**

Ty Danielson

Faculty Mentor: Timothy Watkins

Department of Music

Although most extant music before the Renaissance is for voice, the Renaissance saw the beginning of the rise of purely instrumental music. During the sixteenth century, music for vocal performance began to be reinterpreted for specific instruments or instrumental ensembles. One example of this process is Luys de Narváez’s “La Cancion del Emperador” a vihuela piece based upon Josquin des Prez’s chanson “Mille regretz.” In order to preserve some of the original elements of Josquin’s chanson, Narváez had to take into account and deal with the limitations inherent in the vihuela. An analysis that compares Narváez’s arrangement to Josquin’s original with attention to the idiomatic changes can help shed light on the developments in Renaissance music that paved the way for purely instrumental music not based on vocal models. Narváez’s composition serves as

a transitional stage of the development of instrumental music as it moved away from vocal models to become an independent genre.

1:40-2:00 **Carnal Commodity: The Venetian Courtesan in Renaissance Portraiture**

Jeffrey Knowles

Faculty mentor: Victor Coonin

Department of Art (in collaboration with the Women's Studies Symposium)

Venetian attitudes towards the proper social placement of women, specifically prostitutes in the 16<sup>th</sup> century can be revealed by examining the art that came out of Venice during this period. This investigation looked at the artistic portrayal of upper-class Venetian women where the subject's honor is ambiguous. Throughout an episode in Venice where as many as 10,000 or roughly 10% of the city's population was employed as a prostitute, male authority attempted to impose restrictions on how prostitutes presented themselves in public. Since the courtesan was usually of upper-class standing and financially independent, she could mimic the fashion and refinement of the chaste bourgeois, presenting a facade of propriety that made her social standing and sexual appeal rather ambiguous. Artists recognized the courtesan's ambiguous fashion and social standing and adopted several of those ambivalent elements into their portraiture, further problematizing the suitable or proper representation of women through suggestive poses, garments, gazes and symbols. By analyzing several of these images, Renaissance artists can be shown to manipulate the seductive power of their artistic courtesans in ways that mirror the actual seductive and ambiguous manners employed by Venetian courtesans.

2:00-2:20 **Break**

2:20-2:40 **The Chapel of Eleonora di Toledo: the Unnecessary Argument**

Carrie Wieners

Faculty Mentor: Victor Coonin

Department of Art

Patronage of the arts is often a very difficult matter to evaluate but is nonetheless important in the context of the art historical discourse. Over the last decade, much attention has been placed on the work of Agnolo Bronzino that he completed while in the court of Cosimo de Medici, the first grand duke of Florence. This debate has been vehemently waged between Janet Cox-Rearick and Bruce Edelstein, two scholars who argue for opposite patronage rights of Bronzino's work in the personal chapel of Eleonora di Toledo-de Medici. Cox-Rearick attributes artistic decisions to Cosimo, while Edelstein credits Eleonora with the chapel program. In examining the arguments presented by these two scholars, it is my position that given the evidence of the ducal couple's approach to government and the fact that the imagery in the chapel emphasizes a dual portrait format, trying to prove either Cosimo or Eleonora as the sole patron is ultimately futile. In analyzing the arguments of the scholars in question, I propose that combining both positions in favor of a compromised viewpoint, in which both Cosimo and Eleonora are declared the chapel patrons, ultimately creates the best argument for the chapel's patronage.

2:40-3:00 **Music in Memphis Evangelical Churches**

Ben Tanner

Faculty Mentor: Timothy Watkins

Department of Music

Recent debates regarding evangelical church music has centered around the use of twentieth century "pop" styles in worship. This debate is typically characterized as consisting of two opposing polarities, "traditional" versus "contemporary." Case studies of seven evangelical churches in Memphis (including observing worship services and interviewing music directors) reveal that this characterization is grossly oversimplified and inaccurate. Rather than choosing between mutually exclusive options, churches are better seen as choosing along a continuum with "traditional" and "contemporary" as two extremes. Actual churches operate within a tension between these two poles, between tradition and innovation, between past and future. A church's musical identity is staked upon its position along this continuum. Common issues than face every church in choosing a

music program are the demands of both past and future, the risks of entertainment in worship, and the role of the music director.

3:00-3:20 **“A garden locked...a fountain sealed”: The Song of Solomon in Botticini’s Nursing Madonna**

Georgianna Bowersox

Faculty mentors: Victor Coonin<sup>1</sup>, Ellen Daugherty<sup>1</sup> and Gail Streete<sup>2</sup>

Departments of Art<sup>1</sup> and Religious Studies<sup>2</sup>

With engagement of artistic realism and the explosion of humanist thought, 15<sup>th</sup> century Italian Renaissance society became focused on their relationship with the spiritual in terms of the everyday. Reflecting these notions within art, religious imagery such as the Madonna and Child began to look more contemporary and were now given prominent roles in the home. What was once regarded as purely devotional became functional, existing as an inspirational moral standard and suitable example of a mother-child relationship. This study in particular will examine such quintessential imagery as represented by Florentine artist Francesco Botticini in his work *Nursing Madonna*, circa 1475, presently held at the Memphis Brooks Museum of Art. In doing so, I will attempt to explore the theme of the nursing Madonna in its social, religious, and iconographic contexts while delineating the many possible meanings and societal interpretations of this image. Moreover, my focus intends use Botticini’s *Nursing Madonna* as a case study, in order to define this image as *exempla* for the Tuscan family through conceptions of the Madonna as *hortus conclusus* (or the closed garden) corroborated by the inclusion of relevant iconography pertinent to the nursing Madonna and the Song of Solomon.

**Additional Fine Arts Contributions to URCAS 2005:**

**The Gladys Cauthen Orchestra Soloist Competition**

*Thursday, April 28, 2005*

*4:00 p.m.*

*Tuthill Performance Hall in Hassell Hall*

*The program is presented in its entirety on page 8, following.*

**Orchestra and Wind Ensemble Concert, with the Rhodes Women's Chorus**

*Friday, April 29, 2005*

*7:00 p.m.*

*Evergreen Presbyterian Church*

*The program is available at the performance.*

*Student participants are listed on page 9, following.*



**The Department of Music  
presents**

***The Gladys Cauthen Orchestra Soloist Competition***

Thursday, April 28, 2005

4:00 p.m., Tuthill Performance Hall

Concerto for Flute and Orchestra in G major, K. 313  
*Allegro maestoso* Wolfgang Amadeus Mozart  
(1756-1791)

Leigh Bonner, flute  
JemmiLou Rye, piano

Concerto for Violin and Orchestra in G minor, Op. 26  
*Finale: Allegro energico* Max Bruch  
(1860-1920)

Brittany Bostick, violin  
Tom Barr, piano

Concerto for Piano and Orchestra in D minor, K. 466  
*Allegro* Wolfgang Amadeus Mozart  
(1756-1791)

Kayti Fan, piano  
Tom Bryant, piano

*Suite Modale* for Flute and String Orchestra Ernst Bloch  
(1860-1959)

Emma O'Hagan, flute  
Brian Ray, piano

"Exsultate, jubilate," K. 165  
*Exsultate, jubilate* Wolfgang Amadeus Mozart  
(1756-1791)

Caroline King, soprano  
Brian Ray, piano

Concerto for Flute and Orchestra in G major, Op. 29  
*Allegro* Carl Stamitz  
(1746-1801)

Shruti Acharya, flute  
Brian Ray, piano

"Non più, tutto ascolta... Non temer, amato bene," K. 490  
Wolfgang Amadeus Mozart  
(1756-1791)

Amy Moore, soprano  
Brian Ray, piano

*Andante Spinato and Grande Polonaise Brillante*  
for Piano and Orchestra in E-flat major, Op. 22 Frédéric Chopin  
(1810-1849)

Rene Orth, piano  
Brian Ray, piano

**Rhodes Orchestra and Wind Ensemble**  
Timothy Powell and Courtenay Harter, conductors

Violin

Rebecca Barr  
Brittany Bostick  
Haydée Dijkstal  
Monica Huerta  
Rebekah Miller  
Rameen Nasrollahi  
Scot Ouellette  
Addie Peyronnin

Viola

Kelsey Durrett  
Julie Pasch  
Leah Pranger  
Timothy Pruitt

Cello

Laura Hamper  
Bethany Lindaman

Bass

Jessica Lotz  
Brad Whiteside

Flute

Shruti Acharya  
Leigh Bonner  
Tatiana Cerna  
Marie Cour  
Emma O'Hagan

Piccolo

Tatiana Cerna

Clarinet

Meg Brodman  
Megan Dyer  
Kate Key  
Dane Meyer

Bassoon

Ellen Daugherty\*  
Ross Dawkins  
Terese Holm

Alto Saxophone

Mira Patel

French horn

Peter Ney  
Hanna Young

Trumpet

Josh Jefferies  
John McLaughlin  
Lisa Ulevich

Trombone

Jim Sawyer

Tuba

Aaron McNutt

Percussion

JoBeth Campbell  
Jimmy Cornfoot  
Rene Orth  
Chris Seaton\*

*\*Rhodes Faculty Member*

**Rhodes Women's Chorus**

Mona Kreitner, conductor  
David Ramsey, accompanist

Meredith Allison  
Kimberly Beydler\*  
Jo Beth Campbell  
Meredith Huddleston  
Durham Kyle  
Sonia Nkashama  
Corinne Poole  
Rachel Simmons  
Andrea Turnquist  
Amy Wells

Libby Austin\*  
Brittany Bostick  
Carolyn Cole  
Amy Huffenus  
Michelle Linschoten  
Katina Papatopoulos  
Laura Rigazzi  
Jessica Stewart  
Susan Wang

Sarah Beeson  
Gretchen Bufe  
Elizabeth Connor  
Caroline King  
Elizabeth McClure  
Addie Peyronnin  
Jennifer Ross  
Monica Tam  
Rachel Waterfill  
Katie Yendle\*

*\*section leader*

## **Humanities Oral Presentations – Session 1**

***108 Buckman, beginning at 1:00 pm until 3:40 pm***

***Session Chair: Amanda Irwin, Department of Modern Languages and Literatures***

1:00-1:20 **“¿Qué?”: Las fronteras lingüísticas en la literatura hispana**

Logan Wheeler

Faculty Mentor: Amanda Irwin

Department of Modern Languages and Literatures

No se puede proponer el argumento de que todos los hispanos compartan una sola cultura, pero todas las culturas y subculturas que forman el mundo de hispanohablantes surgen de raíces que se unen debajo de la tierra y la superficie de la historia. El idioma es un elemento obvio que relaciona a esta gente pero también hay componentes de la literatura llevada a través de un océano que sugieren una unidad. Casi desde el principio, la cultura hispana ha tenido que enfrentarse a una multitud de poderes e idiomas extranjeros. Por eso, no es una sorpresa que la frontera lingüística era un tema literario hace siglos tanto como lo es hoy en día. Aunque ya no hay fuerzas imperiales acaudilladas por Iberia o Hispanoamérica, parece que el mundo hispánico sigue metiéndose en enfrentamientos de idiomas. Al investigar unos ejemplos textuales en la forma de un dibujo animado original, se puede ver que las fronteras existen no solamente en la literatura sino también en la vida y “el otro” no es un joven sino un anciano escondido por las décadas.

1:20-1:40 **Into the Crucible: Jewish Feminine Identity in Lispector and Berman**

Will Corvey

Faculty Mentor: Amanda Irwin

Department of Modern Languages and Literatures

This paper will examine the position of Jewish womanhood in two Latin-American environments, those of Mexico and Brazil. Utilizing the poststructuralist approach of Clarice Lispector demonstrated in *Paixao segundo G.H.* among other works and a similar method of questioning inherent in Sabina Berman's *La Bobe*, I will seek to examine the influences of the historical past and the present dominant discourse on the conception of the female Jew in Latin-American and her theoretical position under the blanket of Lacan's *l'Autre*. I will focus on the subversive techniques of the texts in content, context, and rhetoric in order to answer the following questions: what is the Other to Lispector and Berman, and further, what is the nature of the Other in the multi-faceted discourse in which Berman and Lispector's subjects find themselves? In such complex situations, do the possibilities of choice, language, and allegiance allow for the comfortable existence of this simultaneously privileged and feared position created by the Feminist discourse?

1:40-2:00 **Sin Fronteras: La Concepción de Aztlán en la obra de Gloria Anzaldúa, Chirrí Moraga y Ana Castillo**

Brooke McClelland

Faculty Mentors: Eric Henager<sup>1</sup>, Amanda Irwin<sup>1</sup> and David Jilg<sup>2</sup>

Departments of Modern Languages<sup>1</sup> and Theatre<sup>2</sup>

En su obra, Gloria Anzaldúa, Cherríe Moraga y Ana Castillo navegan las fronteras entre su identidad étnica y su identidad de género sexual. Mientras forman su identidad como chicanas liberadas, rechazan los “seres” impuestos exteriormente por una sociedad que consideran racista y sexista. En este estudio, utilizo la noción de la doble conciencia articulada por el sociólogo W.E.B. Dubois como punto de partida para mi análisis de las obras de estas tres autoras chicanas. Propongo que se observa en los textos primarios que estas autoras chicanas, al igual que los afro-americanos de quienes escribía Dubois, se sienten limitadas por los estereotipos de su grupo minoritario. Al responder a la pregunta, “¿Quién es la mujer chicana?”, Anzaldúa, Moraga y Castillo buscan definir ellas mismas una identidad y una conciencia. Al intentar escaparse de las fronteras geográficas y socio-culturales que la sociedad les impone, se basan en una patria imaginada—Aztlán—que puede dar

forma a esta identidad auto-determinada. En su obra, esta región mítica de los aztecas abarca más que su significado mexicana y la concepción del movimiento chicano de los años 70. El nuevo Aztlán es un espacio sin fronteras que incluye a todos los marginados, los pobres, las mujeres y hasta los homosexuales.

2:00-2:20 **La destrucción del arquetipo y la construcción de la verdad: La Virgen de Guadalupe en *El eterno femenino***

Jenna Sadar

Faculty Mentor: Amanda Irwin

Department of Modern Languages and Literatures

Desde hace siglos se ha puesto la Virgen María como el modelo seguir para la mujer. No es muy sorprendente, entonces, que al aparecer la Virgen de Guadalupe ella también se convirtió en un arquetipo literario.; más que eso, es un icono cultural en México. Sin embargo, ponerlas ella y a otras figuras de la historia mexicana es sumamente problemático para la identidad de la mexicana. En su única obra teatral, *El eterno femenino*, Rosario Castellanos nos dirige la atención hacia el modelo literario y cultural de la mexicana y nos obliga a verlo por lo que es – un invento.

Mi presentación se enfocará en el establecimiento de la Virgen de Guadalupe como un arquetipo literario y las técnicas que usa Castellanos para cuestionar ese modelo. Exploro la Virgen de Guadalupe como una figura concreta y las consecuencias de tal en la realidad de la mexicana. De este modo, veremos las características de la Virgen de Guadalupe que se espera encontrar en una mujer verdadera. Luego, la presentación se enfocará en el proceso de desconstruir tal modelo que aparece en *El eterno femenino*. Castellanos analiza lo problemático que es la Virgen de Guadalupe como modelo además de ofrecer una nueva manera de verla.

2:20-2:40 **Break**

2:40-3:00 **Clay Hardens and Wax Melts’’: Women, Magic, and the Binary in the Ancient World**

Caroline Bishop

Faculty Mentor: Kenny Morrell

Department of Greek and Roman Studies

The goal of this paper was to examine the intersection between gender and magic in the ancient world. While it is unclear to what extent Graeco-Roman women actually practiced magic, literary texts offer an overabundance of female magicians, and my paper is devoted to examining the various types of magic that literary witches utilized. Through a case study of three different portraits of the literary witch Medea, I discovered that the type of magic considered licit for Medea, and hence for all sorceresses, changed over time.

By studying these literary portraits, I determined that magic was originally governed by binary oppositions, and these binary oppositions were gendered, making only certain forms of magic permissible for Medea, who, as a woman, was a social inferior. However, as time went on, I argue that magic itself became disadvantaged by an oppositional relationship with organized religion. With the relegation of magic to a subordinate term of a binary, concepts of magic and gender also changed. By the Hellenistic period, Medea was practicing forms of magic that had before been licit only for men. Finally, in the Roman period, Medea has become a witch with almost omnipotent magical prowess. I theorize that this shift of magic from an art practiced by both men and women to an art practiced by women alone occurred because of the facility involved in linking magic, as a now-subordinate term of a binary, with women, another famously subordinate term.

3:00-3:20 **Consequences of the Auricular Veneer in Chariton's *Callirhoe*: Translations or Transmogrifications?**

Zach Harris

Faculty Mentor: Kenny Morrell

Department of Greek and Roman Studies

Typically, the theory that some meaning is lost in any translative endeavor revolves around the relationship between a sign and meaning in one language and the quest for a homologue in another language. I will suggest in this inquiry that readers and translators, through their emphasis on accurate etymologies and intentionality, may risk access to a dimension of meaning that arise from popular etymologies and incidental word juxtapositions. Instead of recognizing etymologies and participating in the debate about the author's use of puns and word-play, I argue that select passages from Chariton's ancient novel, *Callirhoe*, permit readers to encounter the phenomenon of the "auricular veneer." This term refers to words that sound-alike and have analogous meanings. The significance of this observation, I think, is two-fold. One, translators, through having another possible realm of meaning to ponder, must consider whether the catalysts (i.e. words) for this kind of interpretation can be translated into another language. If such is the case, translations may become more like transmogrifications, therefore resembling something along the lines of Joyce's *Finnegans Wake*. Two, following a Hegelian contour, the reader, through the act of reading (and hearing), completes the text by bringing to bear her own experience and curiosities.

3:20-3:40 **Exclusivity in the Ancient World: Speech as a Marker of Inclusion**

Elizabeth J. Roads

Faculty Mentor: Kenny Morrell

Department of Greek and Roman Studies

This paper focuses on speech as a marker of inclusion within different ancient societies in the Greek, Roman, and Hebrew traditions. A community consists of a group of individuals who have a sense of belonging with one another based on some shared characteristic; in this case, I will be examining the trait of speech as that commonality shared by the members. My paper will review the cases of individuals from ancient literary sources and determine how their various speech differences affected their role within society. Some of these speech differences are: speech as a marker of social status, speech as a marker of mental deficiency, and speech as marker of divine proximity. I will review cases of individuals such as Arisophanes' Lampito, L. Junius Brutus, and Moses, and use these examples to construct a typology of speech categories. I will give a brief overview of the role of speech within a community and the typologies of speech, and will provide examples of the individuals studied for this paper.

## **Humanities Oral Presentations – Session 2**

***110 Buckman, beginning at 1:00 pm until 4:00 pm***

***Session Chair: Judith Haas, Department of English***

1:00-1:20 **Reading Pragmatically: The Organic Ties between Pragmatism and Literature**

Jeta Donovan

Faculty Mentor: Marshall Boswell

Department of English

Pragmatism, a prominent strand of American philosophy concerned with fostering meaningful, ameliorative experience and action, provides a valid and helpful frame for studying literature as a useful tool in our lives. My project argues for strong, textual connections between central pragmatic philosophers and pivotal American novels to attest to a long standing relationship between the two disciplines but also to demonstrate the organic and productive role literature can play in achieving pragmatic goals of meaningful experience, constructive action, and social progress. Ralph Ellison's *Invisible Man* is a specific example of this significant intersection of pragmatism and literature.

Ellison's novel employs the ideas of two central thinkers in American philosophy—Ralph Waldo Emerson and William James—and participates in the development of pragmatic ideas by revising, re-interpreting, and contributing to Emerson and James's philosophy by revising Emerson's universalism with James's pluralism. By encouraging the participation of the reader, Ellison's critique of Emerson and James serves as an ameliorative tool for the reader to develop his or her own conceptions of plurality and unity. Thus, *Invisible Man* reveals how the act of reading itself can be a pragmatic act, aimed at turning us towards the use and value of our own experiences.

1:20-1:40 **Speak Now or Forever Hold Your Peace: The Danger of Equality Politics in Same Sex Marriage**

Matt Lovett

Faculty Mentor: Judith Haas

Department of English (Women's Studies Program)

Binary polarization dominates Western discourse today, in effect promulgating oppressive modes of behavior. The queer movement in recent years has attempted to fight such oppression, creating a sturdy base of theoretical dialogue through which such oppressive regimes can be dissected. Using such theoretical perspectives, I attempt to analyze the movement's current state, specifically with regard to the pursuit of legalized gay marriage. While it has historically centered on some essentially "gay" identity, the movement's politics have come to a state of flux: while fighting for a level of acceptance by a dominant and restrictive culture, it seems to have appropriated a policy of assimilation, something that threatens to undermine the movement's fundamental intent. I argue that the pursuit for gay marriage will in fact do just this. Through analyzing the instantiation of identity and the politics that follow from it, I try to set forth a new mode of politics through which the movement can act, one that does not impose a fallacious and restrictive essential "identity." From this, it seems that the fight for gay marriage in fact reproduces dominant discourse without providing an ample critique of its methodology. I argue that marriage, instead of being a right or freedom, is another method of powerful compulsion that in fact restricts freedom rather than perpetuates it.

1:40-2:00 **Students of the Past Students of the Future: Increasing Political Awareness Through Classical Reading**

Jennifer Thompson

Faculty Mentor: Joe Favazza

Department of Religious Studies

Analyzing passages from both *The History of the Peloponnesian War* by Thucydides and *Antigone* by Sophocles, I will attempt to reflect critically on how these texts opened up new perspectives for me on the meaning and role of an engaged citizen. Upon first inspection, it is hard to imagine how a Greek tragedy written in 442 B. C. E and a work of "history" written in 431 B.C.E could possibly affect the political views of a freshman in college in the year 2005. Despite the time gap, I found myself encouraged to continuously question my role as a citizen of the United States after reading *Antigone*. After reading *The History of the Peloponnesian War*, I was overwhelmed at the parallels between our current wartime policies and those engaged by Athens. I was astounded by how applicable and universal Thucydides' insight proved to be. While reading *The History*, I could easily picture a historian reaching similar conclusions on human nature and political warfare based on the actions and decisions of current American society. I found these two works to be instrumental in my development as a more informed citizen, and I sincerely believe that serious reflection on these texts will prove influential for years to come.

2:00-2:20 **The Distinctiveness of Church-Related Colleges and Universities of Various Denominational Traditions**

Daniel Webb

Faculty Mentors: Steve Haynes, Bernadette McNary-Zak and Mark Smith

Department of Religious Studies

Much of the research of the past decade regarding church-related colleges and universities has called attention to the declining importance of the church traditions at many such schools. The competitive market of higher education has pressured church-related schools to push their religious connections to the side. Market pressures drive schools toward homogenization as they are encouraged to follow the trends of a few successful schools. My thesis is that this homogenization of American institutions of higher education is affecting church-related institutions such that many of them are losing their distinctive qualities. While a few church-related colleges and universities rely on their denominational traditions as a source of uniqueness, many fail to honor the distinctive qualities which their denominational traditions can provide for them. In the case of Rhodes specifically, an examination of admissions and recruitment materials reveals recognition of the distinctive qualities of the College, but in many cases it appears that there is a greater concern for what is marketable.

2:20-2:40 **Break**

2:40-3:00 **Regular Army officers Who Became Confederate Commanders: The Motivation Behind Their Choice**

Kelly Garner

Faculty Mentor: Timothy Huebner

Department of History

At the start of the American Civil War, regular Union Army officers were faced with the difficult choice to either remain in the army they had sworn to serve or fight for the Confederacy. Many officers who had served in the military for years choose to resign their positions and join the Confederate Army. Relying upon memoirs and letters written by generals such as Robert E. Lee and James Longstreet, this paper explores their decision to leave behind their careers and social network to fight for the Confederacy.

3:00-3:20 **The Moral Scientist and the Evangelical Reformer: Judicial Attitudes toward Homicide in the Antebellum North and South**

Hailey Hopper

Faculty Mentor: Timothy Huebner<sup>1</sup> and Steve Wirls<sup>2</sup>

Departments of History<sup>1</sup> and Political Science<sup>2</sup>

The differences between the antebellum North and South have long intrigued historians. In exploring these differences, several scholars have used the legal systems of each region to make larger cultural assertions. In particular, scholars have assumed that the Southern legal system, influenced by the code of honor, was lenient in its treatment of homicide. Yet, for the most part, historians and legal scholars have neglected to compare the behavior of leading judges in the two regions. A comparison of the opinions of Chief Justices Lemuel Shaw of Massachusetts and Joseph Henry Lumpkin of Georgia in homicide cases involving self-defense, drunkenness, and insanity as legal excuses reveals no significant differences in terms of their respective interpretations of substantive law. Instead, the cultural differences between the two are manifested in the styles of judicial reasoning they employ, as Lumpkin's opinions are morally motivated and Shaw's decisions are methodically reasoned.

3:20-3:40 **Modern Marvel, Glorified Allegory: The Birth of the Memphis Sears Crosstown Building**

Jeffrey Knowles

Faculty Mentor: Timothy Huebner

Department of History (Rhodes Institute for Regional Studies)

During a period when the attitude of an influential civic-elite in Memphis called for progressive urbanization, one building acted to satisfy those aspirations, forecasting future economic expansion for the city. Situated within the context of Southern urbanization, the rise of a mail-order empire, and the emergence of commercial art-deco architecture, Sears Crosstown reveals a story of commercial *time* and urban *place* told within the context of communal and corporate transition. Sears, Roebuck & Company's entrance into Memphis acted like a spotlight for a city desperately seeking commercial recognition in areas beyond its agricultural tradition. City-wide fascination and pride for the building inspired a surge of local patriotism, exalting the modern marvels and futuristic devices within the building, its impressive magnitude and record-setting construction time. By looking at a period in which a new chapter in Sears retail growth coincided with a distinct phase in the development of Memphis, this investigation seeks to document ways one city prepared for and reacted to the arrival of "the world's largest store."

3:40-4:00 ***Break ("Helping Families Help Themselves: The Porter-Leath Early Intervention Program" has been shifted to the Humanities Poster Session, 1:00-4:00 Buckman Foyer.)***

### **Humanities Poster Presentations**

***Buckman Foyer, beginning at 2:30 pm until 3:45 pm***

***Session Chair: Kathleen Doyle, Department of Modern Languages and Literatures***

***All posters will be available for viewing from 1:00 to 4:00. At least one of the student collaborators will be in attendance and available for discussion from 2:30-3:45. If a specific collaborator is presenting, that coauthor name is underlined.***

### **Ana Maria Matute: Su Vida y Sus Obras/Her Life and Her Works**

Daniel Case

Betsy Duckett

Laine Royer

Anna Cantrell

Faculty Mentor: Kathleen Doyle

Department of Modern Languages and Literatures

Ana Maria Matute is a Spanish author whose writing was heavily influenced by her childhood experiences during the Spanish Civil War. Her stories focus primarily on children and the socially rejected and their relationships with the rest of society. Matute's writing is rich in description and critical analysis. Often times her stories are laced with a personal touch that reveals her emotional connection to her work. We will explore the various aspects of Matute's childhood that ultimately had a strong influence on her work as an author.



**Carmen Laforet**

Laura Groezinger

Sarah-Katherine Wright

Paul Echols

Faculty Mentor: Kathleen Doyle

Department of Modern Languages and Literatures

Carmen Laforet is a female Spanish writer who was born September 6, 1921 in Barcelona. She lived in the Canary Islands for the next 18 years of her life, during the time of the Spanish Civil War (1923-1939), after which she returned to Barcelona. She is famous for her first full-length novel, Nada, for which she received the Nadal Prize at the very young age of 22.

**An Analysis of Three Poems by Federico García Lorca: La guitarra, Canción de jinete, and Romance sonámbulo**

Rebecca Koftan

Ben Trentlage

Faculty Mentor: Kathleen Doyle

Department of Modern Languages and Literatures

We will be examining carefully three poems by Federico García Lorca, a member of Spain's group of poets called the "Generation of '27". We will examine each poem's dramatic situation through an analysis of the speaker, the recipient to whom poem is directed, the tone, and narrative events. Imagery plays a large part in these poems, so we will investigate symbolism, and what sort of themes are conveyed through the images. Examining the rhetorical techniques used in each poem (by noting any metaphors and similes, personification, irony, allusions, etc.) will allow us greater understanding of the message. Finally, it will be necessary to scrutinize the poems' structures. Overall, a composite of these analytic methods should yield better insight into García Lorca's poetry.

**Carme Riera's "El Reportaje"- A Closer Look at the Spanish Feminist's Powerful Story**

Emily Clark

Kevin Davidson

Daniel Keedy

Sonia Singh

Faculty Mentor: Kathleen Doyle

Department of Modern Languages and Literatures

Carme Riera, born in Mallorca, Spain in 1948, is a respected narrator, script-writer, and essayist of the 21<sup>st</sup> century. Exemplifying the style of post-Franco authors, Riera writes in castellano as well as the colloquial speech of her native Mallorca, called mallorquin. Riera has received numerous distinguished awards for her works, including the 1989 Ramon Llull Prize for *Por persona interpuesta*, the 1994 Prudenci Bertana Prize for *Dins el darer blau*, and the Ministry of Culture National Prize for Narrative. In 2000, the Generalitat (Autonomous Government) of Catalonia awarded her the St. George Cross. Riera also demonstrates her feminist attitude through her stories, such as *Doce relatos de mujeres* (1982). A close investigation of Riera's "El Reportaje," which appeared in *Doce relatos*, revealed well-developed and strong female characters as well as powerful themes, such as the difficulty of remaining objective in the field of journalism. By employing specific literary techniques, Riera effectively conveys how fantasy, reality, and literature influence the female reporter.

**Helping Families Help Themselves: The Porter-Leath Early Intervention Program**

Sheria Holmes

Faculty Mentor: Leslie Petty

Department of English (Women's Studies Program)

The purpose of this project was to explore the gender issue of the feminization of poverty through working in a program targeting low-income, single-parent, female-headed households. Poverty is a cycle that cannot be broken without knowledge and because these girls get pregnant so early they are not often able to finish their educations and therefore end up in low wage jobs because they have neither the skill nor the education to find jobs that would take

them out of poverty. This program stresses the need for education and the importance of it for not only the child, but also the mother. The program also connects the mother to important information on child safety as well as information about her own safety such as domestic violence issues. To accomplish this goal I worked in the Porter-Leath Early Intervention Program. I met with clients on a monthly basis to discuss nutrition, health care, child development, discipline, and other important topics in childrearing. I worked mainly with teenage mothers because they seemed to be the population who needed this program the most. I think that it is important that this information be presented to the larger community because it shows a positive image of single women with children, a group that usually thought of negatively, helping themselves and their children advance in life.

## **Natural Sciences Oral Presentations – Session 1**

***225 Ohlendorf, beginning at 10:40 am until 12:00 noon***

***Session Chair: Jay White, Department of Physics***

### **10:40-11:00 Frequency analysis of ultrasonic backscatter signals from human bone**

John A. Janeski

Faculty Mentor: Brent Hoffmeister

Department of Physics

There is increasing interest in developing ultrasonic backscatter techniques for detecting changes in bone density caused by diseases like osteoporosis. Objective: To measure two ultrasonic backscatter parameters, apparent integrated backscatter (AIB) and the frequency slope of apparent backscatter (FSAB) using a broadband 7.5 MHz system. AIB represents the frequency averaged power in the backscattered signal and FSAB represents the slope of the frequency dependence of this power. Methods: Cubes of cancellous (i.e. spongy) bone with side lengths of 15 mm were prepared from the heads of 10 human femurs (7 donors). Data was collected by mechanically scanning the ultrasonic transducer over each bone specimen and acquiring the backscattered signals. These were post-processed to obtain a single value of AIB or FSAB for each specimen. In addition, the mass density of each specimen was measured by allowing the specimen to air dry for 24 hours and then dividing the mass of the specimen by its volume. Results: AIB and FSAB both demonstrated highly significant linear correlations with density,  $p < 0.001$  and  $p < 0.001$ , respectively. Conclusion: AIB and FSAB are sensitive to changes in bone density, and may provide a useful new clinical technique for detecting and monitoring osteoporosis.

11:00-11:20 ***Break (“Mössbauer Spectroscopy” has been withdrawn.)***

### **11:20-11:40 MAPSCI: Web Server for Multiple Protein Structure Alignment**

Adam Isom

Faculty Mentor: Ivaylo Ilinkin

Department of Mathematics and Computer Science

This work describes the important problem in bioinformatics of multiple structure alignment for proteins and discusses an implementation of a publicly-accessible web server for the Multiple Alignment of Protein Structures and Consensus Identification (MAPSCI) algorithm developed at the University of Minnesota. The web server is designed to provide MAPSCI users with an intuitive and robust interface. Users have the option of uploading their own protein structures or selecting structures to be downloaded automatically from the Protein Data Bank. The alignment results are presented in the standard NBRF/PIR and JOY formats. Additionally, a visualization applet is integrated into the web server allowing users to visualize the final alignment. Various tools have been written in the Python programming language to aid in performing alignment-related tasks. This interface significantly increases the usability of the MAPSCI algorithm by allowing researchers everywhere to make use of the algorithm in an easy and intuitive manner, and requires no extra tools for producing input files or visualizing alignments. Current effort is directed at producing a proof of concept for accomplishing fast protein database searching using consensus structures.

11:40-12:00 **Finding Association Constants for Ionic Molecules using Monte Carlo**

**Integration**

Paul Sinclair

Faculty Mentor: Shubho Banerjee

Department of Physics

Research into the condensation of ionic systems requires calculating a six dimensional integral that relates the number of free ions to the number of neutral molecules. Regular methods of integration, such as using the software *Mathematica* prove inadequate. Instead we use Monte Carlo Integration that uses random sampling of the integrand to estimate its average. Multiplying by the limits of integration for each variable then yields an estimate of the integral with accuracy that depends on the number of sampled points. The process is easily expanded to multiple dimensions and gains in accuracy over other methods (for the same computation time) as the number of dimensions increase. The error is estimated by looking at the variation in the final answer for different trials. We wrote a C++ program to evaluate our integral. To generate random numbers for sampling we used a random number generator called the *Mersenne Twister*. Due to the severely “spiked” nature of the integrand, we developed weighting methods for each variable to get a better sampling of the spikes and thus reduce sampling errors. Running the final program for 125,000,000 sampled points and 100 trials at each value of temperature, we achieved accuracy to within 0.2%.

**Natural Sciences Oral Presentations – Session 2**

***Frazier Jelke Lecture Hall B, beginning at 1:00 pm until 3:40 pm***

***Session Chair: Mary Miller, Department of Biology***

1:00-1:20 **Structural Studies of the N-terminal region of choline binding protein A, the major adhesin of *Streptococcus pneumoniae***

Ross W. Hilliard<sup>1</sup>

Richard W. Kriwacki<sup>2</sup>

Faculty Mentor: Jay Blundon<sup>1</sup>

Department of Biology<sup>1</sup>, Rhodes College and Department of Structural Biology, St. Jude Children’s Research Hospital<sup>2</sup>

*Streptococcus pneumoniae* (pneumococcus) remains a significant health threat worldwide, especially to the young and old. While some of the biomolecules involved in pneumococcal pathogenesis are known and understood in mechanistic terms, little is known about the molecular details of bacterium/host interactions. Our work is focused on understanding how the major adhesin, a protein called CbpA, binds to and causes pneumococcal invasion of human cells. Here we report the results of experiments aimed at determining the 3D structure of the N-terminal domain of CbpA. We are optimizing CbpA-N for study using nuclear magnetic resonance (NMR) spectroscopy using biochemical methods. We previously identified significant unstructured regions using NMR in an N-terminal construct comprised of CbpA residues 39-174. These unstructured regions increase the level of difficulty in determining the protein structure using NMR. To reduce such interference we used proteases to trim away unstructured amino acids, leaving only the folded core of CbpA-N. We used mass spectrometry and computer methods to identify disordered regions of CbpA-N and then designed an optimized construct. We report here the results of these studies along with the work currently underway as a result of the structural determinations.

1:20-1:40 **Analysis of Proteins that Interact with Common Mdm2 Splice Variants**

Justin Marlar<sup>1</sup>

Linda C. Harris<sup>2</sup>

Faculty Mentor: Mary Miller<sup>1</sup>

Department of Biology<sup>1</sup>

Department of Molecular Pharmacology, St. Jude Children's Research Hospital<sup>2</sup>

The oncoprotein MDM2 functions as a negative regulator of the tumor suppressor p53. The different splice variants of MDM2 have been found to be expressed within many different types of human tumors. Many of these splice variants are unable to bind to and regulate p53. The splice variants actively bind full-length MDM2 and prevent it from associating with p53, causing an up-regulation of p53. Previously published data have shown that several MDM2 splice variants promote accelerated tumorigenesis in Eμ-myc transgenic mice. MDM2-A and MDM2-B are two common MDM2 splice variants often found in human tumors. MDM2-B accelerates tumorigenesis in the Eμ-myc mouse model, whereas MDM2-A does not. The goal of this study was to evaluate different proteins that bind to full length MDM2, as well as those that bind to the splice variants A and B that may account for their different tumorigenic activities.

1:40-2:00 **The Role of Interleukin-16 in Motor Learning**

Bradley W. Petkovich

Faculty Mentors: Jay A. Blundon and Catherine P. Fenster

Department of Biology

Neuronal interleukin-16 (NIL-16) is expressed specifically in the hippocampus and cerebellum, brain regions associated with certain forms of learning. NIL-16 can be enzymatically cleaved to result in neuronal secretion of IL-16; thus, NIL-16 is a precursor of IL-16, a cytokine associated with immune system functions. Because we believe that IL-16 may be a signaling molecule that regulates learning processes in the brain, the purpose of this study was to investigate the possibility that IL-16 plays a role in motor learning. To address this possibility, we used an accelerating rotarod test to compare motor learning for IL-16 knock-out and wild-type mice. Both groups were initially exposed to the rotarod (constant speed of 12 RPM) for seven days. We compared the duration that mice remained on the accelerating rotarod (from 0 to 36 RPM) during the "learning" phase (two trials per day for four days) and for the "memory" test (following a week of non-exposure). No significant differences were observed between knock-out and wild-type mice on the accelerating rotarod tests but we are currently performing additional behavioral tests to reveal any potential effects of IL-16 on motor learning.

2:00-2:20 **Break**

2:20-2:40 **Group B Streptococcus (GBS) Induces Caspase-Mediated Apoptosis of Respiratory Epithelial Cells**

Monica Huerta<sup>1</sup>

Glen Ulett<sup>2</sup> and Elisabeth Adderson<sup>2</sup>

Faculty mentor: Gary Lindquister<sup>1</sup>

Department of Biology<sup>1</sup>, Rhodes College, and Department of Infectious Diseases, St. Jude Children's Research Hospital<sup>2</sup>

Background - GBS is an important cause of neonatal pneumonia and sepsis. Infection of respiratory epithelial cells by GBS induces cell injury, a process that contributes to bacterial invasion. To identify the nature of this cytotoxicity, we characterized cell death pathways activated by GBS infection using a serotype III strain, 874391, and its isogenic beta-hemolysin-deficient mutant, Cyle-. Methods - A549 respiratory epithelial cells were infected at a ratio of 5:1 (bacteria:cell) for 4 hours. Numbers of eukaryotic cells undergoing apoptosis were determined by fluorescence-activated cell sorting analysis using AnnexinV-FITC and propidium iodide stains in the presence or absence of 5% glycine and with increasing concentrations of the caspase-3 inhibitor Ac-DEVD. Results - Infection of

A549 cells with wild type GBS 874391 resulted in a reduction in numbers of viable cells within 4 hours. The percentage of viable A549 cells infected with the beta-hemolysin deficient strain CylE did not differ from that of uninfected controls. Pretreatment of epithelial cells with glycine to inhibit necrosis did not increase the viability of GBS-infected cells, however, Ac-DEVD treatment reduced the number of cells undergoing apoptosis in a dose-dependent manner. Conclusions - Infection of A549 respiratory epithelial cells with serotype III GBS induces rapid cell death. As previously suggested, most cytotoxicity is attributable to the expression of GBS beta-hemolysin. Cell death induced by GBS infection is caspase-3 dependent and involvement of the intrinsic pathway of apoptosis is suggested. Inhibition of cell death pathways induced by GBS may be a novel strategy to reduce the morbidity and mortality of neonatal pneumonia.

2:40-3:00 **Electrophysiological Investigation of the Effects of NIL-16 on Long Term Potentiation in Mouse Hippocampal Slices**

Jessica A. Devitt

Faculty Mentors: Jay A. Blundon and Catherine P. Fenster

Department of Biology

The purpose of this experiment was to determine the effects of neuronal interleukin-16 (NIL-16) on long term potentiation (LTP) in the mouse hippocampus. Previous studies have reported that NIL-16 is found in the hippocampus, a brain region associated with learning and memory. We believe that NIL-16 may play a role in the LTP and the learning process. The C-terminus of NIL-16 is identical to the cytokine pro-interleukin-16. IL-16 knock-out mice show spatial memory deficits compared to their wild type siblings. Therefore, to test whether IL-16 secretion influences LTP, we performed electrophysiological tests on hippocampal slices from wild type and IL-16 knock-out mice. Stimulating electrodes were placed in the CA3-Schaffer collateral pathway and the recording electrode was placed in the CA1 dendrite region. After baseline low frequency (0.033 Hz) postsynaptic potentials (PSPs) were recorded, a frequency tetanus stimulation was administered, followed by low frequency stimulation for 60 minutes. If the slope of the post-tetanus PSP was significantly greater than the slope of the pre-tetanus PSP, we concluded that LTP had occurred. Although we had hypothesized that LTP would be reduced with the absence of IL-16, we found no significant differences in LTP between the wild type and IL-16 knock-out mice.

3:00-3:20 **Monitoring Unfolded Protein Response Activation in Solid Tumors**

Emily Ann Furlow<sup>1</sup>

Linda M. Hendershot<sup>2</sup>

Faculty Mentor: Terry Hill<sup>1</sup>

Department of Biology<sup>1</sup>, Rhodes College and Department of Genetics and Tumor Cell Biology, St. Jude Children's Research Hospital<sup>2</sup>

Poorly vascularized solid tumor cells encounter adverse conditions, including hypoxia, nutrient deprivation, and pH changes, that can activate stress-response pathways. The unfolded protein response (UPR) is activated in response to altered conditions in the endoplasmic reticulum that affect protein folding and may play a crucial, cytoprotective role in tumor growth and resistance to chemotherapy. A UPR-inducible reporter construct was obtained in which green fluorescent protein (GFP) expression was regulated by ER stress. It was introduced into C6 rat glioma cells to determine the extent of UPR activation in solid tumors. Two stable clones were established in which GFP expression was >20-fold higher after ER stress and nearly 100% of the cells responded. They were tested *in vitro* to determine the time course, magnitude, and threshold conditions for UPR activation, and found to be indistinguishable from the parental line. Marked C6 cells were introduced into mice for tumor production. Analysis of isolated tumor cells revealed an increase in GFP expression, strongly indicating that UPR activation occurs in this glioma model system. This study demonstrates the feasibility of using this UPR-inducible reporter construct for future *in vivo* studies on the effects of UPR activation on tumor growth and resistance to chemotherapeutic regimens.

3:20-3:40 **Role of MRP4 in Testosterone Transport**

Matthew D. Cain<sup>1</sup>

Rachel Bowden<sup>2</sup>, Vishal Lamba<sup>2</sup>, Masashi Adachi<sup>2</sup>, Mark Leslie<sup>2</sup> and John D. Schuetz<sup>2</sup>

Memphis, Tennessee

Faculty Mentor: Jay Blundon<sup>1</sup>

Department of Biology<sup>1</sup>, Rhodes College and Department of Pharmaceutical Sciences, St. Jude Children's Research Hospital<sup>2</sup>

The multidrug resistance-associated protein, MRP4 is an ATP-dependent binding cassette transporter that belongs to a family of transporters which efflux various organic anions. MRP4 effluxes diverse molecules including endogenous purines cAMP, cGMP, as well as those with steroid nucleus, and bile acids. MRP4 also confers chemotherapeutic drug resistance by exporting various anticancer agents. However, despite a wide tissue distribution, little is known about the function of MRP4 in vivo. Evaluation of MRP4-deficient mice revealed that prepubescent mice had a dramatic reduction in circulating testosterone despite normal testes morphology. Immunohistochemical analysis demonstrated expression of MRP4 in leydig cells, the primary source of circulating testosterone. Unexpectedly, these mice exhibited normal testosterone levels post-puberty. We set out to discover the mechanisms by which MRP4-deficient mice compensated for the loss of MRP4. We used microarray to assess testes from post-pubertal MRP4-deficient and wildtype mice, discovering an upregulation of several genes involved in testosterone biosynthesis. Further candidate gene analysis revealed an upregulation of several transporters which apparently compensate to transport testosterone in the absence of MRP4. These studies reveal that MRP4 plays a fundamental role in providing systemic testosterone and that its absence requires upregulation of ancillary pathways in testes to maintain testosterone biosynthesis and transport.

### **Natural Sciences Oral Presentations – Session 3**

***Frazier Jelke Lecture Hall A, beginning at 1:00 pm until 3:40 pm***

***Session Chair: Tom Barr, Department of Mathematics and Computer Science***

1:00-1:20 **High Copy Suppression Analysis of Mis-localized G1 Cyclin *CLN3* in the Budding Yeast *Saccharomyces cerevisiae***

Katie Jameson

Faculty Mentor: Mary Miller

Department of Biology

Cell division involves a series of integrated and coordinated events during which a single cell grows, duplicates, and segregates into two cells. G1 cyclin proteins, such as *CLN3*, function to integrate intracellular and extracellular signals to initiate the cell cycle in a process that ultimately leads to cell division. Non-regulated division can result in cell death or uncontrollable division contributing to cancer. While *CLN3* is thought to regulate division in response to cellular signals, little is known about its upstream regulators and downstream targets. Wildtype *CLN3* predominantly localizes to the nucleus, however our study, utilizes a *cln3* mutant that localizes to the cytoplasm. This mutant is unable to trigger division, and is therefore responsible for a lethal phenotype. We are investigating the molecular basis of *CLN3* activity through high copy suppression analysis. Genes that are able to suppress the *cln3*-dependent phenotype are identified using a transformation protocol with a high copy number plasmid library. The high copy suppression analysis screen of mis-localized *cln3* has yielded various groups from which we have subsequently obtained candidate genes responsible for suppression. These candidate genes include the G1 cyclins (*CLN1*, *CLN2*, and *CLN3*) as well as the B-type cyclins (*CLB1*, *CLB2*, *CLB5*, and *CLB6*). Additionally, this screen has yielded three unknown groups with non-plasmid linked suppression. We are currently working to further characterize the mechanism by which these groups are suppressing the cytoplasmic *cln3*-dependent phenotype.

1:20-1:40 **Reducing Expression of Neuronal Interleukin-16 using Small Interfering RNA**  
Sinifunanya E. Nwaobi

Aaron Creek

Faculty Mentors: Jay A. Blundon and Catherine P. Fenster

Department Biology

Neuronal interleukin-16 (NIL-16) is a cytoskeletal associated protein found exclusively in the cerebellum and hippocampus. NIL-16 selectively interacts with several neurotransmitter-gated and voltage-gated ion channels that are important for neural signaling. We believe that the interaction of NIL-16 with these ion channels may serve to regulate channel function and / or localization. A direct and concise approach to investigate this possibility would be to compare the functional properties of these ion channels in neurons with normal or reduced NIL-16 expression. Therefore, the purpose of this study was to develop and test a method for reducing NIL-16 expression levels using small-interfering RNA (siRNA). This technique allows for specific gene silencing by targeting messenger RNA molecules that contain identical sequences for degradation. Using immunocytochemistry, it is demonstrated that siRNA targeting NIL-16 effectively reduces levels of artificially expressed NIL-16 protein in human-embryonic cells. Future studies are aimed at silencing NIL-16 in neurons and investigating the role of NIL-16 in regulation of ion channel function.

1:40-2:00 **Subcellular localization of RP1L1 protein in photoreceptors**

Andrew Romeo<sup>1</sup>

Jiewu Liu<sup>2</sup> and Jian Zuo<sup>2</sup>

Faculty Mentor: Darlene Loprete<sup>1</sup>

Department of Chemistry<sup>1</sup>, Rhodes College and Department of Developmental Neurobiology, St. Jude Children's Research Hospital<sup>2</sup>

Retinitis pigmentosa (RP) is a common retinopathic disease characterized progressive loss of night and peripheral vision that can eventually lead to blindness. Mutations in retinitis pigmentosa 1 (RP1) represent 5-10% of autosomal dominant forms of RP in humans. RP1 is a novel microtubule associated protein (MAP) localized in the outer segment axoneme of the photoreceptor. Knockout studies of RP1 revealed that lack of RP1 causes progressive degeneration of photoreceptors and mislocalization of rhodopsin. By searching EST databases a gene encoding a protein (RP1L1) was found that shows high homology with RP1 in the N-terminal half of the protein and therefore represents a useful model in studying the function of RP1. Mutations in RP1L1 are also a potential cause of RP disease even though no current studies have found any connection between RP disease and mutations in RP1L1. In this study, antibodies are raised against a fragment of murine RP1L1 in the C-terminal half of the protein. The antibodies are then used to determine the subcellular localization of the RP1L1 within the photoreceptors. A comparison of the localization of the two proteins will help determine the exact roles of certain protein domains.

2:00-2:20 **The role of light and oxygen in *Chaoborus punctipennis* diel vertical migration**

Mark Stratton

Faculty Mentor: David Kesler

Department of Biology

Aquatic midge larvae (*Chaoborus punctipennis*) exhibit diel vertical migration in response to fish visual predation, remaining in deeper waters during the day and ascending nocturnally to feed. During warm months, Yellow Poplar Tree Lake (YPTL) in Shelby County, Tennessee exhibits dissolved oxygen stratification. Anoxic conditions (<2.0 mg/L) and light penetration determine the depths at which larvae are found during the day. At night, larvae ascend above anoxic layers with reduced risk from visual predators. I collected and compared discrete depth samples from YPTL on October 8, 2004 and March 4, 2005 from 1600 to 2200 hours. Sampling in both months revealed nocturnal ascension, but migration was more dramatic in the unstratified March water column. The lack of larvae during the day anywhere in the March water column is attributed to toxic conditions and high water clarity. The purpose of this ongoing study is to investigate the seasonal dynamics of *Chaoborus*

migration in response to light and dissolved oxygen concentrations in the water column. I hypothesize that as oxygen stratification intensifies seasonally, dissolved oxygen rather than light will become the greater factor in determining average daytime and nighttime depths.

2:20-2:40 **Break**

2:40-3:00 **Putative mannose transporters complement Calcofluor hypersensitivity and hyperbranching in a mutant of *Aspergillus nidulans*.**

Lauren Fay<sup>1</sup>

Stanley R. Vance<sup>2</sup>

Caroline V. Sartain<sup>1</sup>

Faculty mentors: Loretta Jackson-Hayes<sup>2</sup>, Terry W. Hill<sup>1</sup> and Darlene M. Loprete<sup>2</sup>

Departments of Biology<sup>1</sup> and Chemistry<sup>2</sup>

In order to identify novel genes affecting cell wall integrity, we have generated mutant strains of the filamentous fungus *Aspergillus nidulans*, which show hypersensitivity to the chitin synthase inhibitor Calcofluor White (CFW). The phenotype of one of these strains (R205) also shows morphological abnormalities related to branching and septation. We have cloned two DNA fragments from an *A. nidulans* genomic DNA library (R205 XF2 and R205 XF3), which improve resistance to CFW and restore a more normal phenotype. The smaller plasmid contains an ORF (R205 MT2, AN8848.2) showing homology to GDP-mannose transporters. The second plasmid contains two ORFs, one showing a similar but distinct ORF homologous to GDP-mannose transporters (R205 MT3, AN9298.2), and another gene with homology to glutathione-S-transferases (GST). Morphological analysis revealed partial to full restoration of subapical hyphal compartments, and branch density in the mutant transformed with R205 MT2. When separately cloned, the putative GDP-mannose transporters restore normal phenotype while the putative GST does not. Preliminary sequencing reveals the smaller plasmid contains a genetic lesion in Exon 5. Work is underway to determine chromosomal location with genetic mapping.

3:00-3:20 **Development of Novel Analytical Techniques for Detection of *Streptococcus pneumoniae* in Patient Samples**

David Watkins<sup>1</sup>

Brad Pendley<sup>2</sup>

Faculty Mentor: Loretta Jackson-Hayes<sup>1</sup>

Department of Chemistry<sup>1</sup>, Rhodes College and College of Medicine, University of Tennessee Health Science Center<sup>2</sup>

Differential diagnosis of bacterial pneumonia caused by *S. pneumoniae* is of particular importance in the care of immune-compromised hospital patients, for whom it is desirable both to prevent the onset of frank infection and to guard against prophylactic abuse of antibiotics. *S. pneumoniae* has been shown to produce hydrogen peroxide as a normal byproduct of its metabolism; we proposed two independent methods to measure hydrogen peroxide in patient samples and correlate increasing concentrations of this substance with increasing numbers of *S. pneumoniae*. First, chronoamperometry was used in bacterial growth media to measure the presence of hydrogen peroxide due either to standard addition or to metabolism by colonies of *S. pneumoniae*. Obstacles such as rapid consumption of hydrogen peroxide by the growth media, unexpected production of hydrogen peroxide by a negative control strain, and the low selectivity of the technique prevented further development. Second, a chemiluminescence-based detection method was evaluated; reaction parameters and a spectrophotometric detection setup were optimized and the presence of peroxide due to standard addition was measured. Sensitivity of this method was found to be slightly lower than desired for *in vivo* detection. Additionally, a condensation apparatus was constructed to model human expiration and collect artificial breath containing small amounts of hydrogen peroxide; little data was obtained from this setup because of time constraints on the project. For either method, proof-of-principle of detection



of hydrogen peroxide was established, though in either case further refinements are necessary before clinical implementation of the new technique is possible.

3:20-3:40 **Complementation of a Calcofluor-hypersensitive mutant in *Aspergillus nidulans* by a novel transmembrane protein**

Stanley Vance, Jr.

Faculty Mentors: Darlene Loprete<sup>1</sup> and Terry Hill<sup>2</sup>

Departments of Chemistry<sup>1</sup> and Biology<sup>2</sup>

The cell wall serves a variety of roles pertinent to fungal reproduction, growth, and differentiation. However, the details of cell wall assembly and metabolism in fungi are incompletely understood. Previously, novel genes and proteins associated with cell wall integrity have been identified by studying fungal mutants with increased sensitivity to Calcofluor white (CFW), a chitin synthase inhibitor. The strain R191, which carries a mutation designated *calF*, has been successfully complemented. I show that three complementary plasmids from two wild-type genomic libraries rescue R191's phenotype. All three encode the *Aspergillus nidulans* hypothetical protein AN2880.2, a transmembrane protein with 11 membrane-spanning domains. Furthermore, sequencing data shows that *calF*'s allelic lesion resulted in an amino acid substitution of arginine which is positively charged for glycine which is uncharged. Therefore, the protein encoded by AN2880.2 most likely plays a role in establishment or maintenance of cell wall integrity in *Aspergillus nidulans*.

**Social Sciences Oral Presentations – Session 1**

***302 Clough, beginning at 10:20 am until 12:20 pm***

***Session Chair: Nick McKinney, Department of Economics and Business Administration***

10:20-10:40 **A State by State Analysis of Beer Consumption in the United States**

Laura Stanford

Faculty Mentor: Nick McKinney

Department of Economics and Business Administration

A large quantity of literature on beer consumption notes variances in consumption levels across the United States; however, no one study attempts to determine the causes of these variances. This study utilizes OLS regression techniques to isolate determinants of beer consumption variances across the U.S. using data obtained on a state by state level in 2000. Variables that represent differences in physical state characteristics, state demographic profiles, as well as beer tax differentials are analyzed to ascertain their respective impacts on the levels of beer consumption across the states. Preliminary results show relationships between the level of beer consumption and the age, educational attainment, ethnicity, and urbanization of the population of a state.

10:40-11:00 **Game, Set, and Match: A Monte Carlo Simulation and Evaluation of Clutch Players on the Professional Tennis Tour**

Laura Hoffmeister

Faculty Mentor: Nick McKinney

Department of Economics and Business Administration

This paper uses econometric and game theoretical techniques to analyze performance in professional tennis. More specifically, I create a model that estimates which players in tennis matches have a greater chance of winning, given their skill levels on the serve, return of serve, and other aspects of the game. I also take into account non-player specific factors such as court surface, tournament round and seed. The data is taken from men's singles matches played at the four most recent Grand Slams, the 2004 French Open, US Open, and Wimbledon, and the 2005 Australian Open. Monte Carlo simulations are currently being designed in order to generate hypothetical data which, when compared to actual data, will reveal which players are capable of achieving a higher level of performance on critical points in the match.

11:00-11:20 **Changes in Capital flows into South Korea during the Asian Financial Crisis**

Alex Hornaday

Faculty Mentor: Nick McKinney

Department of Economics and Business Administration

Although the Asian Financial Crisis began in Thailand and subsequently spread to many other East Asian nations, South Korea provides a peculiar example. South Korea was the most developed and economically powerful of the Asian countries that were severely hit, but its almost miraculous growth of the preceding decade was not enough to stave off crisis. Using times series regression techniques I examine the flows of capital, both portfolio investment and foreign direct investment, into (and eventually out of) South Korea for a decade preceding the crisis and two years following. This analysis uses quarterly-measured traditional macroeconomic variables, such as GDP growth, inflation, current account balance, and government finance. I also consider other types indicators of interest to investors such as exchange rate, amount of foreign exchange reserves held by the central bank, bank solvency, and the behavior of other investors. By considering the information available to investors on macroeconomic and other factors, I develop an econometric model that attempts to determine the primary causes for loss of investor confidence in South Korea at the end of 1997.

11:20-11:40 **Still Heard on the Street? The Effects of Takeover Rumors on Stock Prices**

James Ray

Faculty Mentor: Nick McKinney

Department of Economics and Business Administration

This article examines the different effects of rumors on the stock prices of a sample of rumored takeover targets. I used an approach similar to that of a 1990 Pound and Zeckhauser study that was published in *The Journal of Business*. I chose to revisit this topic in light of the increased scrutiny and regulation surrounding rumormongering on Wall Street.

By using the *Wall Street Journal's* column "Heard on the Street" to identify rumors and select rumored takeover targets, I analyze the efficiency of the market's reaction to the publication of these rumors by looking at the excess return from buying or selling the stock of the rumored firm upon publication of the rumor. I also look at the price and volatility of the stock of each company 20 trading days prior to the rumor's publication in order to identify any price run-up or speculation. Actual takeover bids of rumored targets are noted and used to identify the accuracy of the rumor's prediction.

11:40-12:00 **Race and Compensation of Quarterbacks in Professional Football**

Matt Dement

Faculty Mentor: Nick McKinney

Department of Economics and Business Administration

This paper focuses on the question of whether African-American and white quarterbacks are paid different amounts based on their performance. Although there have been numerous analyses of racial discrimination in professional baseball and basketball, only five previous studies have focused on discrimination in professional football. Further, only one of these studies have taken player performance statistics into account when determining whether or not discrimination is present. This paper found that African-American quarterbacks have significantly less experience, more rushing yards per game, and get injured more frequently than do white quarterbacks. They do not, however, earn significantly less than their white counterparts when performance statistics are taken into account.

12:00-12:20 **“The Market’s Reaction to the September 11<sup>th</sup> Attacks: An Empirical Investigation of” the Aerospace and Defense Industry**

Pratik Patel

Faculty Mentor: Nick McKinney

Department of Economics and Business Administration

Though little has been written about the market’s reaction to the September 11<sup>th</sup> terrorist attacks, stock market behavior has been the subject of much academic research for nearly a century. First introduced by Eugene Fama in 1970, the efficient market hypothesis (EMH) suggests that security prices reflect all available information. On this basis, financial markets are thought to be rationale and efficient in reflecting the underlying value of firms. Beginning in the 1980’s, however, researchers found certain anomalies that caused them to question the efficiency and rationality of capital markets. The consensus among experts is that past notions of market efficiency are flawed in explaining the volatile nature of the stock market. The September 11<sup>th</sup>, 2001, terrorist attacks offer academic scholars a chance to analyze the market’s reaction to an unexpected, catastrophic event. Given the psychological impact of the attacks, it is not surprising that the overall market fell by seven percent when trading resumed on September 17<sup>th</sup>, 2001. Previous studies provide evidence of market rationality in the pricing of airline stocks after the terrorist attacks. I examine stock returns of firms operating in the aerospace and defense industry on September 17<sup>th</sup>, 2001. Significant abnormal stock returns were found for the majority of the firms operating in both industries. Furthermore, my findings also support the hypothesis of rational pricing and suggest the market differentiated among the various firms operating within the aerospace and defense industry on the basis of operational characteristics, capital structure, and other financial measures.

**Social Sciences Oral Presentations – Session 2**

***102 Clough, beginning at 10:20 am until 12:00 noon***

***Session Chair: J. Peter Ekstrom, Department of Anthropology/Sociology***

10:20-10:40 **Science as Religion: Durkheim’s Views on the Function and Purpose of Religion**

Lauren Bartling

Faculty Mentor: Thomas McGowan

Department of Anthropology/Sociology

Historically, the fields of science and religion have always been at odds with each other. According to Emile Durkheim this conflict is unnecessary because science fulfills a purpose similar to the purpose of religion. This paper is an examination of literature pertaining to the views on science and religion, as well as an analysis of the philosophy of the “Father of Sociology,” Emile Durkheim. This topic must be explored as it has much sociological and personal significance in light of the fact that humans encounter both science and religion on a day-to-day basis. In my paper, I conclude that science is a type of religion because it fulfills social roles and functions necessary for human survival and productivity.

10:40-11:00 **The Effects of Religious Motivation on Transnational Terrorism**

Sarah Sanders

Faculty Mentor: Lawrence Hamlet

Department of International Studies

Religiously motivated terrorism is on the rise around the world. That is, certain terrorist organizations utilize religion as a motivating factor in committed strategic terrorist attacks. Does the interpretation of religious beliefs affect terrorist organizations’ behavior? In short, does religion have an independent causal effect on the shape of terrorist attacks? This article examines two theories that seek to account for the usage of religion by a terrorist group—that religion is used as a strategic tactic for mobilization purposes and that religion is what motivates a terrorist group to commit acts of terror. Through a combination of these two theories, I argue that a terrorist organization’s interpretation of a

religion, as well as its own political goals, establishes a worldview in which the terrorists operate rationally and strategically, which affects the shape of the terrorism employed by the organization. In particular, with the usage of religion, I argue that religiously-motivated terrorist organizations are more likely to follow the target pattern hypothesized by the religious terrorist model: non-believers, wayward believers, and then indiscriminate crowds, which is displayed in Hamas and American Christian Patriots as opposed to the IRA and the Tamil Tigers.

11:00-11:20 **Format information: The Plight of the Roma and their Search for a Common Identity**

Christine Coy

Faculty Mentor: J. Peter Ekstrom

Department of Anthropology/Sociology

Arriving in Europe around the 14<sup>th</sup> century AD, the nomadic population pejoratively referred to as “the Gypsies” have historically faced oppression and discrimination from those whom they encountered. Traveling from town to town, Gypsy, or more properly Roma, populations eventually separated and scattered throughout the European continent, leaving in their paths reactions of mystery and distrust. As centuries followed and migrations continued, the Roma faced exclusion, discrimination, and enslavement throughout Europe and, eventually, the Americas. Though a nomadic lifestyle often defined this population, the diffuse nature of their migration simultaneously affected the formation of their ethnic identity. As they migrated into various social structures, so too did their identities migrate into inconsistent characterizations. Today, the Roma population of Europe is quickly becoming the continent’s largest, poorest, and fastest-growing ethnic minority. Large-scale prejudice and discrimination persist in challenging social gains for the Roma population. In an effort to fight social injustice, the establishment of a common, unified Roma identity has become imperative. This presentation will explore historical evolutions in the common identity of the Roma people while considering recent efforts to more clearly understand what it means to be “Roma.”

11:20-11:40 **Michael Taussig: A Montage: A Critique of Methodology, Material, and Style**

Mary Claire Giffin

Faculty Mentor: J. Peter Ekstrom

Department of Anthropology/Sociology

In Taussig’s book, *Shamanism, Colonialism, and the Wild Man: Study of Terror and Healing*, he stresses the importance of Walter Benjamin’s use of “dialectical images”. These images which are described as dialectical find their reference in the Marxist view of the dialectic: “the process of change through the conflict of opposing forces, whereby a given contradiction is characterized by a primary and a secondary aspect, the secondary succumbing to the primary, which is then transformed into an aspect of a new contradiction.” Taussig refers to dialectical images, by way of Theodore Adorno, as “picture puzzles which shock by way of their enigmatic form and thereby set thinking into motion.” In order to display the strength in such images, Taussig utilizes the technique of “montage,” a juxtaposition of images. In doing so, Taussig is able to communicate and captivate his audience by seizing their attention with images of the past, present, future, and even himself, for Taussig himself is a montage: an anthropologist of the stage, a historical thespian, an informative entertainer. This presentation is a critique of Taussig’s methodology, material, and style within Anthropology.

11:40-12:00 **Writing A Death Wish: The Cut In TennCare**

Eliza Hanson

Faculty Mentor: J. Peter Ekstrom

Department of Anthropology/Sociology

There are 30,000 people in Memphis who rely on TennCare as their health care and who without would die. Governor Bredeson is ignoring the fact that the people enrolled in TennCare are dependent upon this as their only form of health care. These people are from the working class and without TennCare will be part of the uninsured in Memphis. I spent time meeting with those in Memphis who would be affected by the possible cuts. There are programs that will be forced to cut spending in social

service areas in order to accommodate the health needs of their social service recipients who currently rely on TennCare for their health problems. Some of the enrollees will have their death sentence written by the cuts. In this documentary all these topics are explored and addressed in hopes that this information will be able to help show that cutting TennCare is the equivalent to putting 30,000 people in their graves.

### **Social Sciences Oral Presentations – Session 3**

***102 Clough, beginning at 1:00 pm until 4:00 pm***

***Theme: “Ethnography at Home”***

***Session Chair: Susan Kus, Department of Anthropology/Sociology***

1:00-1:20 **Luck versus Skill: An explorative look at competitive dart players**

Elizabeth Cummings

Faculty Mentor: Susan Kus

Department of Anthropology/Sociology

Ethnography lets the researcher view a world that has probably gone unnoticed by most people. Through ethnography a researcher can come to a better understanding of the “other” and their culture. Due to the fact that we live in a society that is increasingly more concerned with sports, winning and competition, I chose to study a part of this world of competition. For the past couple of months I have studied a dart league team through participant observation at a local bar in Memphis called Billiard’s East. By joining a dart team, by observing and speaking to other dart players, and by playing darts myself, I have learned about this cultural scene in more depth than a casual observer. Through this observation I decided to examine the difference between luck and skill during a game and how the players come to attribute their performance to luck or skill. I also plan to look at the competitive nature of the players especially when they bring violence into this non-contact sport when they think they are throwing bad darts (or as they call it “having bad luck”).

1:20-1:40 **Bearin’ Witness for this Jazzin’ Fitness: A Deeper Look into the Culture of Jazzercise**

Merritt McMullen

Faculty Mentor: Susan Kus

Department of Anthropology/Sociology

Ethnographic fieldwork can allow a researcher through personal lived experience and active participation to develop an insider’s view and capability of understanding what it is like to be a part of another culture or cultural scene. Over the past semester I have been observing and participating in jazzercise classes in Memphis to learn about the culture of Jazzercise and to find out why this activity attracts such a large number of women in the Memphis area and even around the world. Jazzercise has been around since 1969 and is now the worlds leading dance-fitness program with more than 5,800 instructors teaching 20,000 classes weekly worldwide. Millions of people, primarily women, of varying ages and fitness levels join together in this activity that combines elements of jazz dance, resistance training, Pilates, yoga, kickboxing, and more. In my study of jazzercise I plan to shed some light on the women’s devotion to the practice, the social bonds that are formed, and the ‘sense of community’ that is fostered through this ritual jazzin’ activity of fun and excitement.

1:40-2:00 **Feminism in Practice: An Ethnographic Study of Memphis Women’s Action Coalition (WAC).**

Chellie Bowman

Faculty Mentor: Susan Kus

Department of Anthropology/Sociology

In the field of anthropology, the ethnographic method is characterized by the active participation of the social scientist in the cultural scene she is studying, rather than a distanced and detached observation. Ethnography, in allowing one to directly engage with and learn about the “Other”, simultaneously produces self-reflection on the part of the ethnographer, creating a situation for in-depth understanding. During this semester, I undertook an ethnographic investigation of a contemporary local Memphis feminist group, WAC (Women’s Action Coalition), and of the women who are its members. The last wave of the Women’s Right’s Movement peaked in the 1960’s and 70’s. Isn’t feminism over? Haven’t women’s issues been solved? Why then are there still groups like WAC? This study looks at the diversity of the members of WAC and through their narratives answers questions such as “Who are these women?”, “Why did they join?”, and “What makes these different women come together?”. The study further explores what feminism looks like today by looking at the current issues of women’s rights, the local feminist response to these issues, and feminism in actual practice, not just in theory.

2:00-2:20 **Java Jargon: Ethnography of an Independent Coffee Shop**

Hazami Barmada

Faculty mentor: Susan Kus

Department of Anthropology/Sociology

The Ethnographic method emphasizes the importance of participant-observation in a culture in order to understand what occurs within culture to shape it. This semester I became a part of the coffee culture at Republic Coffee and observed the interactions and the atmosphere fostered within the colorful walls of the coffee house. Coffee has come to represent more to the average caffeine-dependents than simply a beverage; it has become a culture of its own with specific coffee lingo and symbolism. The aroma of the coffee lingering in the air lures customers in to sit, relax, study, and read in the inviting atmosphere. Amid the big corporation coffee chains, like Starbucks, is the emergence of unique independent coffee shops. They foster a different environment than that offered by Starbucks, and as my ethnography explored, contain characteristics that reflect the owner or workers. Through participant-observation of Republic Coffee, I gained insight on how the coffee sub-culture was shaped and whether the fostered atmosphere it was deliberately made.

2:20-2:40 **Break**

2:40-3:00 **Sing a Song: Observing a Karaoke Bar in Memphis**

Ashley Mitchem

Faculty Mentor: Susan Kus

Departments of Anthropology/Sociology

Ethnography requires personal and active engagement in the field to initiate an inductive study of a unique culture or cultural scene. I have long been intrigued by the cultural and societal aspects of karaoke and have chosen the ethnographic method as my means of study. I have been a participant-observer at the Sports Bar and Grill (3569 S. Mendenhall Road) to try and determine the underlying sociological themes that play out in the karaoke bar scene amongst the bar “regulars”. This bar is unique because it is the only bar in the Memphis area to offer karaoke seven nights a week. I have found an intriguing environment that calls for certain social interactions between bar regulars and the bar employees, including the “KJ”. There are unspoken rules of engagement that must be obeyed once one steps through the bar entrance. My study focuses on these social interactions, rules and behaviors and how they may relate to the daily, ordinary social interactions of individuals in our larger American culture.

3:00-3:20 **“It’s only natural!”: Small independent natural food markets in a world of artificial colors, flavors, and large corporations**

Stephanie Goldstein

Faculty Mentor: Susan Kus

Department of Anthropology/Sociology

Ethnographies allow us to step into the world of the “other” by access of participant observation, and doing ethnography provides an opportunity to have first-hand experience with cultures and cultural scenes that are so different from our own. In order to understand the importance of organic and natural markets in the community I undertook an ethnography during this semester observing and interviewing the owner and employees of Square Foods, an independently owned organic food store in Midtown, Memphis. Midtown is home to many alternative lifestyles and beliefs, but one thing that many people in the area have tended to support in the last fifteen years is natural and organic food. As the owner of Square Foods told me one day, “pure and unadulterated food is a necessity, not a privilege”. Even though people’s individual lifestyles may be vastly different from one another, independent natural food markets tend to create their own community. My ethnographic study allowed me to understand how such communities are created and sustained.

3:20-3:40 **Just Another Day at Work: Ethnographic Study of an Abortion Clinic**

Julia Dobbins

Faculty Mentor: Susan Kus

Department of Anthropology/Sociology

Ethnography and the art of participant observation give us the chance to see inside the lives of those around us and to better understand their culture. One of the most beneficial outcomes of ethnography is that it has the power to dispel popular and incorrect stereotypes we assume about others based on the culture they participate in. This semester I engaged in an ethnographic study of the cultural scene that is generated by the staff of Memphis Regional Planned Parenthood during abortion clinic hours. The practice of abortion has been at the forefront of policy reform and political controversy for several years however little is known about the people who provide the service. In this study, I learned more about those who work in the clinic, why they chose to work there and how, or if, working at an abortion clinic affects their life outside of work. It quickly became apparent that the participants in this cultural scene functioned as both professional healthcare providers and close-knit family members. Although the staff members are conscious of their controversial work place, their lives are not as mysterious or politically driven as one might think. Like most people their concerns, hopes, and joys are centered on their work, family, and future. My study attempts to bring light to the people behind the controversy and to show how their lives parallel our own.

3:40-4:00 **The Circle that Unites Us All: An Ethnographic Study of Gibson’s Donuts**

Cameron Rochelle

Faculty Mentor: Susan Kus

Department of Anthropology /Sociology

Using the ethnographic method I engaged in a Memphis subculture to see how it contributes to the larger Memphis community. I was a participant observer in this subculture and saw the inner workings of a small business. Gibson’s Donuts has been a part of Memphis since 1968 and has always served the city by providing fresh donuts twenty-four hours a day. I have done an ethnographic study of how this donut shop has stayed in business over the years while competing with grocery stores and chains like Krispy Kreme and Howard’s Donuts. Also I have taken a particularly close look at the regular crowd in the donut shop that sit at the large, central “community” table and create an atmosphere of warmth and friendliness for all of the customers, whether it is a small child or an elderly individual. There is something special about the way Gibson’s Donuts is run that we have lost in the ever growing world of cell phones and automated check out lines.

**Social Sciences Oral Presentations – Session 4**  
***302 Clough, beginning at 1:00 pm until 4:00 pm***

***Session Chair: Marsha Walton, Department of Psychology***

1:00-1:20 **Exploring Campus Climate and Racism through Focus Groups**

Stephanie Albury

Kristina Dean

Albani Walker

Faculty Mentor: Anita Davis

Department of Psychology

This research is a continuation of research conducted on the campus climate of Rhodes College during the Fall 2004 semester. Focus groups comprised of approximately 10 students will meet to further discuss issues of inclusion/belonging, satisfaction with social and academic supports available to students, and generate ideas and suggestions for improvement of the campus climate. Students who previously completed the online Campus Climate survey and indicated a willingness to further participate in the research will be contacted as potential participants. The focus groups will last approximately 45 minutes and will be co-facilitated by Dr. Davis and Stephanie Albury. Students who have expressed an interest to help with this research project will be present to aide in the note taking and recording of the discussion. Ultimately, we hope that this information can be used to promote positive environmental changes at Rhodes that will improve the experience and success of all students.

1:20-1:40 **Classroom Narrative Culture: An Exploratory Study of How the Classroom Environment Can Shape Children's Story-telling**

Jessica Struby

Faculty Mentor: Marsha Walton

Department of Psychology

In our study, 434 inner-city 4<sup>th</sup> – 6<sup>th</sup> graders from two Memphis elementary schools were asked to write a conflict narrative at two points during the academic year. Our study proposes that a sense of classroom 'atmosphere,' reflecting both teacher and peer influence, emerges over the course of the school year. Our aim is to explore how narrative similarities, among different children in the same class, cluster in such a way that distinguishes classrooms from one another. In other words, our study will explore the possibility that different classrooms will begin to demonstrate their own set of "narrative norms," shaping the kinds of stories that children tell. We will examine how students' narrative complexity and other features of their stories change over the course of the year. We will also compare overall scores between the 21 classrooms. Our exploratory study seeks to develop a methodology for assessing classroom narrative culture and, in doing so, we hope to support future research that may implement our measures.

1:40-2:00 **"Hit me up if you wanna chat": Violence Metaphors and the Rhodes Community**

Sandra L. Keller

Faculty Mentor: Marsha Walton

Department of Psychology

Though many believe that metaphors are nothing but flowery language, metaphors are far more prevalent in and central to culture and meaning than most think. The language we use in everyday interaction is full of metaphor, and our choice of what words to use influences the concepts through which we structure our world – especially our jointly negotiated cultural worldview. Because violence is a pressing social problem, one might expect it to emerge as a prominent metaphor in our social interactions. I conducted a descriptive, exploratory analysis of metaphor on the Rhodes campus to investigate whether and how Rhodes students use and hear violence metaphors in their everyday lives.



Indeed, violence was used often to describe diverse areas of activity, such as communication, effort, politics, studying, relationships, and others. I found that less severe violence metaphors were used more than more deadly ones, but that highly destructive violence was still used frequently to describe experience. Gender differences also emerged; though men's and women's metaphors described similar genres of violence, women's metaphors tended to be less severe than men's. Women were also far more likely to victimize other women in their metaphors, while men victimized both genders equally; as a result, women were victimized more often overall. Results are discussed in terms of the social construction of gender and of the power of metaphor to structure – and possibly improve – society.

2:00-2:20 **The Impact of Corruption on Returns to Schooling**

Courtney Collins

Faculty Mentor: Teresa Beckham Gramm

Department of Economics

Education has long been recognized as an important factor in a country's growth function. However, recent economic research finds little or no correlation between investment in education and increased income for least developed countries. If this research is accurate, it can be concluded that either increased education does not lead to human capital or human capital does not generate increased income. In this study, I focus on the second possibility and introduce corruption as variable that affects returns to schooling. I create and empirically test a model that shows corruption's effect on the relationship between education and wages. I find that corruption decreases schooling's positive effect on wages and that corruption's impact is lessened with degree of centralization.

2:20-2:40 ***Break***

2:40-3:00 **Determinants of Students' Satisfaction with College**

Will Rives

Faculty Mentor: Nick McKinney

Department of Economics and Business Administration

The problem of attracting and retaining students has always been one which researchers and college administrators have attempted to solve. Being able to understand why a student leaves college will help colleges improve their retention rates, and this is economically beneficial to the institution, itself. The main research on this topic has highlighted academic and social integration into college as the main determinants of a student's decision about whether to stay or leave. In 2003 and 2004, Rhodes administered the CSXQ and CSEQ surveys to students at the beginning and end of the academic year in order to judge their expectations about and experiences from college. The data from these surveys was used in order to test whether such things as involvement in extracurricular activities or academic achievement do in fact lead to greater student satisfaction with the college. I hypothesize that involvement in greek activities will have a negative effect on grades, but a positive effect on student satisfaction, and thus retention. I also believe that involvement in other activities such as campus clubs and organizations will have positive effects on satisfaction. My final hypothesis is that students who are more satisfied with their academic advisor will subsequently be more satisfied with the college experience.

3:00-3:20 **Predicting First-year Performance at Rhodes**

Lynn Keathley

Faculty Mentor: Nick McKinney

Department of Economics and Business Administration

Many colleges and universities use models to attempt to forecast prospective students' performance once they enter college. Some high school students also use models to attempt to predict their own performance at colleges they are considering. Most of these regression models use independent variables such as high school grade point averages and standardized test scores to predict first-semester or first-year grade point averages. Although many of these models do have some predictive power, I believe that there are other important variables that are commonly excluded. I hypothesize that the model that Rhodes currently uses can be expanded to have more predictive power by including other factors that also significantly affect first-year performance. Using data from the Admissions Office, I will attempt to identify and isolate the variables that have a significant affect on first-year grade point averages at Rhodes. If a more thorough model can be developed, it will help both colleges and universities and prospective students more accurately predict performance and thus find better academic matches between institutions and prospective students.

3:20-3:40 **Education: The Subprime Market Failure**

Caroline Downing

Faculty Mentor: Teresa Beckham Gramm

Department of Economics and Business Administration

The subprime mortgage market is a relatively young financial market that has experienced significant expansion within the last 15 years. There have been considerable growing pains as the relatively high number of foreclosures has adversely affected both borrowers and lenders. The industry experienced a consolidation period in the late 1990s, the number of total subprime loans is still increasing and the inefficiencies associated with lending to second-tier borrowers remains a topic of debate. This paper attempts to pinpoint inefficiencies through analysis of the market selection failure where lower levels of education lead borrowers to the subprime market. I model entry into the subprime market and estimate an inverse relationship between education and subprime market entry after correcting for applicant income, loan amount, percent minority, percent of population over 65, and the mean property value of a census tract. Using data for four different cities over a three year period I find that education level is negatively related the probability of subprime mortgage origination and that this relationship strengthens with time. I tested this model using the Home Mortgage Disclosure Act (HMDA) raw data from 2001, 2002, and 2003 for loans made to borrowers within the Orlando, New Orleans, Austin, and Memphis metropolitan statistical areas (MSAs).

3:40-4:00 **Why Countries Join International Institutions: A Domestic-Based Approach**

Dane Meyer

Faculty Mentor: Lawrence Hamlet

Department of International Studies

As a variable in political science, international institutions have been crucial to shaping political events in the twentieth century. Regional institutions such as the EU have influenced everything from a member nation's currency and trade policies to how members recognize foreign patents. Likewise global institutions such as the United Nations and NATO have created new nations such as Israel and formed bipolar security alliances responsible for fifty years of global conflict, respectively. Consequences like these deserve attention as to how they originated, and while the future ramifications of international institutions may be difficult to predict, it is important to understand why countries join or reject these institutions. One potential answer focuses on the role of domestic actors in influencing a country's decision making. I argue that domestic preferences working with and through domestic institutions create a combined preference for joining or not joining an international institution. This explanation is tested on three case studies: Poland and the European Union, Japan and the "Coalition of the Willing," and Russia and the Kyoto Accords.

## **Natural and Social Sciences Posters – Session 1: Natural Sciences**

***Frazier Jelke Lobby beginning at 1:00 pm until 3:00 pm***

***Session Chair: Richard Redfearn, Department of Chemistry***

***All posters will be available for viewing from 1:00 to 4:00. At least one of the student collaborators will be in attendance and available for discussion from 1:00-3:00. If a specific collaborator is presenting, that coauthor name is underlined.***

### **Measuring the Rotational Velocity of the Sun Using the Doppler Effect and a Homemade Spectrometer**

Kevin Andring

Drew Scott

Faculty Mentors: Brent Hoffmeister and Jay White

Department of Physics

Spectrometers are devices that use diffraction to separate a light source into a continuum of wavelengths. By projecting light through a diffraction grating, emission or absorption spectra can be recorded and used to analyze characteristics of the light source. When the source of the light has a velocity relative to an observer, these wavelengths are shifted by an amount directly related to the velocity of the light source. The goal of this experiment is to use the wavelength shift, known as the Doppler effect, to measure the rotational velocity of the Sun about its axis by observing its absorption spectrum. Using an off-axis, Mylar solar filter and a neutral density filter attached to a Schmidt-Cassegrain telescope as well as a spectrometer we constructed ourselves, we will take measurements of wavelengths in the absorption spectrum of the Sun at different locations on its visible surface and measure the Doppler shift due to the rotational velocity. Using the shift in wavelength, we will then determine the rotational velocity of the Sun.

### **Experimental Models for Understanding the Role of PUMA During Hypoxia**

Emily Backues<sup>1</sup>

Gerard Zambetti<sup>2</sup> and John Jeffers<sup>2</sup>

Faculty Mentor: Darlene Loprete<sup>1</sup>

Department of Chemistry<sup>1</sup>, Rhodes College and Department of Biochemistry, St. Jude Children's Research Hospital<sup>2</sup>

Hypoxia often occurs in the centers of solid tumors due to a lack of sufficient oxygenated blood transported to the tissue. In response to hypoxia, cells express a multitude of genes, some of which eventually destroy the irreversibly damaged cells. p53, a well known tumor suppressor, is accumulated *in vivo* during hypoxic conditions, and triggers p53 dependent apoptosis. Little is known about p53 targets that are induced by p53 or that mediate p53-dependent apoptosis during hypoxia. *Puma* (*p53 upregulated modulator of apoptosis*) is a downstream target of p53 that mediates cell death through both p53-dependent and independent pathways. We sought to investigate the necessity of Puma for an apoptotic response during hypoxic conditions. Initially, untransformed MEF cells (mouse embryonic fibroblasts) were utilized, and exposed to a level of 0.1% oxygen for 6-48 hrs, after which a series of cell viability assays, RT-PCR, and western blots were performed. The resulting ambiguous data, as well as further experimentation on both thymocytes and bone marrow cells, led to a conclusion that oncogenetically transformed MEF cells would be the most suitable model for the hypoxia experimentation. This will facilitate in a more complete understanding of the mechanism by which cell death occurs during hypoxia.

### **The Diffusion of Heat through Metal**

Scott Barrows

Adam Keckler

Whitney Tidwell

Faculty Mentors: Brent Hoffmeister and Shubho Banerjee

Department of Physics

The diffusion equation is a partial differential equation that describes how heat will theoretically diffuse through a material with respect to position and time. The equation has one constant  $\kappa = K / C\rho$ , where  $K$  is the thermal conductivity of the material,  $C$  is its specific heat, and  $\rho$  is its density. Our goal is to use the diffusion equation to calculate the theoretical temperature at given points along one and two dimensional surfaces and to compare those values with our experimental measurements at the same points. The measurements will be made visually by placing thermochromic liquid crystal sheets on the materials. Thermochromic crystals display a different color at different temperatures of the surface it is in contact with. The color changes will be recorded with a digital camera and analyzed using digital software.

### **Calcofluor Hypersensitivity and Spore Swelling in a Mutant Strain of *Aspergillus nidulans***

Taylor Brown

Joe Vaughan

Faculty Mentor: Terry Hill

Department of Biology

Fungi play essential roles in decomposition, food production, and disease. The cell walls of fungi provide essential structure and function for the organisms. While many structural features of the wall are understood, many more aspects remain a mystery. We focused on a strain of *Aspergillus nidulans*, 6-107, which shows evidence of inherited cell wall defects, which include hypersensitivity to Calcofluor-White (CFW), a wall synthesis inhibitor, and an over swelling of the spores (“swo”). Initially, we were interested in whether CFW sensitivity and swo are caused by separate genes or are manifestations of the same gene. To answer this question we crossed strain 6-107 with another strain (GR5), which exhibits neither CFW sensitivity nor swo characteristics. The progeny demonstrated that these traits are indeed separable in this strain, and are therefore the results of different genes. Preliminary observations indicated that there exists a linkage between the swo locus and the locus governing pyridoxine synthesis. This observation will allow us to locate this gene to a small section of a single chromosome, which is helpful in identifying and characterizing the gene and product.

### **Reducing Expression of Neuronal Interleukin-16 using Small-Interfering RNA**

Aaron T. Creek

Sinifunanya E. Nwaobi

Faculty Mentors: Catherine P. Fenster and Jay A. Blundon

Department of Biology

Neuronal interleukin-16 (NIL-16) is a cytoskeletal associated protein found exclusively in the cerebellum and hippocampus. NIL-16 selectively interacts with several neurotransmitter-gated and voltage-gated ion channels that are important for neural signaling. We believe that the interaction of NIL-16 with these ion channels may serve to regulate channel function and/or localization. A direct and concise approach to investigating this possibility would be to compare the functional properties of these ion channels in neurons with normal and reduced NIL-16 expression. Therefore, the purpose of this study is to develop and test a method for reducing NIL-16 expression levels using small-interfering RNA (siRNA). This technique allows for gene-specific silencing by targeting messenger RNA molecules that contain identical sequences for degradation. Using immunocytochemistry, it is demonstrated that siRNA targeting NIL-16 effectively reduces levels of artificially expressed NIL-16 protein in human-embryonic cells. Future studies are aimed at silencing NIL-16 in neurons and investigating the role of NIL-16 in the regulation of ion channel function.

### **The Gut-Reactor Theory and Giant Pandas: Internal Digesta Mixing as a Complication for Intake Modeling**

G. Moss Driscoll

Faculty Mentor: Allen Jaslow

Department of Biology

This study attempted to determine if giant pandas (*Ailuropoda melanoleuca*) have the ability to internally mix digesta by conducting fourteen combined trials on a male and female giant panda at the Memphis Zoo. To test the pandas for internal digesta mixing, two separate colors of corn kernels were fed to the pandas at different time intervals (5, 10, and 15 minutes) and panda feces were subsequently examined for presence of the two corn types. Individual feces samples containing both colors of corn were taken to be evidence of internal digesta mixing. Overall, both the pandas displayed the ability to internally mix digesta, with this ability increasing as the time interval between the feeding of corn types decreased. These results indicate that panda digestive processing does involve internal mixing, thus adding to the current knowledge regarding the digestive strategy of this endangered species. Furthermore, the existence of this attribute creates a complication for diet models that attempt to link the biological processes of digestion to food intake, most notably, the gut-reactor theory. However, this does not indicate an abject failure of such models, but instead suggests the need to refine them to include the more complex and intricate processes involved in animal digestion.

### **Optimizing the Stack Geometry for a Thermoacoustic Refrigerator**

Hallie Graves

John Janeski

Faculty Mentor: Brent K. Hoffmeister

Department of Physics

Thermoacoustic refrigerators are cooling devices that use sound waves to compress a gas instead of a conventional mechanical compressor. The device operates by adiabatically compressing a gas (typically air) trapped in a layered or porous “stack” material. The goal of this study is to measure the thermal performance of a layered stack for different layer separations. The performance of the refrigerator is dependant on the thermal penetration depth of the gas at a specific resonating frequency and its relation to the layer separation. We are constructing a thermoacoustic refrigerator that uses a roll of 35 mm photographic film as the stack material. Monofilament fishing line is used to evenly separate the layers of the roll of film. The rest of the device consists of an air-filled acrylic tube with an audio speaker connected to one end, and an aluminum plug that seals the other end. The speaker is driven at a resonance frequency of the tube by an amplified sinusoidal signal. The temperature difference between the ends of the tube will be measured as a function of layer spacing (monofilament diameter) of the stack.

### **Grooming Behaviors of Captive Bonobos**

Jennifer Herrold

Faculty Mentor: Tony Becker

Department of Biology

The bonobos at the Memphis Zoo were investigated as the subject of this research endeavor. Two of the zoo’s three female bonobos (Kiri and Lasalla) and the one male bonobo of the group (Mo) were the focus of this study. Specifically, the grooming interactions between Mo and Lasalla, and between Mo and Kiri were observed in the indoor bonobo habitat and the outdoor bonobo habitat. When such grooming interactions occurred, it was noted which bonobos were involved and how long the interaction lasted in seconds. The reason for this study’s focus on the grooming behaviors between the three bonobos mentioned above is because Mo impregnated both Kiri and Lasalla during the November 2004. Bonobos have between an eight and nine month gestation period and the purpose of this investigation was to test the null hypothesis that Mo has/had no preference as to which pregnant female he grooms (as judged by total time spent grooming each female). As Mo is the male partner in each pregnancy, it is reasonable to presume his behavior would promote the health and survival of each adult female bonobo and infant equally, thus the assumption of the null hypothesis. Upon completion of observation, the time Mo spent grooming Kiri will be summed, as will the time spent grooming Lasalla, and statistical testing will be done to determine if there is a significant difference between the total time spent grooming Kiri and the total time spent grooming Lasalla.

## **A Microstructural Study of Ultrahigh Molecular Weight Polyethylene using TEM and Pyrolysis GC-MS**

Terese A. Holm<sup>1</sup>

Carl W. Carlson<sup>1</sup> Rhodes '04

M. Andrew Scott<sup>2</sup>

Karyn E. Spence<sup>2</sup> Rhodes '03

Matt Shanks<sup>2</sup>

Asit K. Ray<sup>3</sup>

Faculty Mentors: Richard Redfean<sup>1</sup> and Ann Viano<sup>2</sup>

Departments of Chemistry<sup>1</sup> and Physics<sup>2</sup>, Rhodes College; Department of Chemical and Biochemical Engineering, Christian Brothers University<sup>3</sup>

Ultrahigh molecular weight polyethylene (UHMWPE) is a commonly used material in human joint prostheses. The combination of its non-reactivity in the body and its mechanical properties make UHMWPE ideal for cartilage replacement in artificial knee and hip joints. A drawback is the material's production of submicron wear particles, which can cause adverse biological reactions. Post processing of the material with gamma-irradiation and annealing has been shown to reduce the production of these wear particles. While the effects of these treatments on the macroscopic properties of UHMWPE have been investigated, few researchers have studied their effects on the molecular level of structure. We have used transmission electron microscopy to visualize the crystalline (lamellar) and amorphous regions of the polymer, and measured a "stacking parameter" that quantifies the degree of lamellar freedom in the polymer. This method was combined with a chemical analytical technique, pyrolysis coupled with gas chromatography-mass spectrometry (GC-MS), which identifies the types and extent of crosslinking. Together, these two methods have provided a determination of the microscopic structure of UHMWPE due to post-manufacturing treatments. The results should provide insight into future material processing to reduce wear in this important artificial joint material. This poster will emphasize the pyrolysis GC-MS method for UHMWPE characterization.

## **Complementation of Cell Wall Defects in a Mutant of the Filamentous Fungus *Aspergillus nidulans***

Daniel Keedy

Faculty Mentors: Terry Hill<sup>1</sup>, Annette Teepe<sup>1</sup> and Darlene Loprete<sup>2</sup>

Departments of Biology<sup>1</sup> and Chemistry<sup>2</sup>

In filamentous fungi, hypersensitivity to the chitin synthase inhibitor Calcofluor White (CFW) can be correlated to defects in cell wall stability. We have generated a hypersensitive strain of *Aspergillus nidulans* (R121) which also displays a temperature-induced alteration of spore morphology. We have complemented R121's phenotype using plasmids from two *A. nidulans* genomic DNA libraries. Currently we are isolating and analyzing plasmid DNA from several complemented R121 strains. In strain W, which shows increased tolerance of CFW and a more normal spore morphology, the responsible plasmid is integrated into the genomic DNA. We excised and sequenced a portion of this plasmid and determined in which region of the *A. nidulans* genome it is found. We then created vector constructs containing two genes from this region and reintroduced them into R121. Work is underway to test the phenotypes of strains transformed with these constructs and thereby determine the genes' rescuing ability. Two other transformed strains (P and T) are similar to W in phenotype and in containing an integrated plasmid. Interestingly, however, we can isolate from these strains a family of non-integrated plasmids, which we interpret as resulting from spontaneous plasmid excisions. We are currently analyzing the DNA in the genomic region represented by this plasmid and will test the rescuing ability of nearby genes.

### **NMR Study of the Host-Guest Complexation of a Commercial Chlordane Sample with $\beta$ -Cyclodextrin and $\beta$ -Cyclodextrin Triacetate**

Rachel M. Methvin

Faculty Mentor: Richard Redfearn

Department of Chemistry

One long-term threat to urban environmental health and safety is the occurrence of persistent organic pollutants (POPs) in urban soil and water. Some of these compounds are associated with acute and chronic human toxicity. In Memphis, there has been recent awareness of the occurrence of polychlorinated pesticide residues in the soil along Cypress Creek in Midtown and North Memphis neighborhoods. These POPS are artifacts of the production of the pesticide chlordane by the chemical company Velsicol, although production was halted in the late 1980s. One possible route to remediation of Cypress Creek soil is the possible phytoremediation scheme of allowing the organochlorine POPS to be translocated up into the native plants growing on the banks. A previous study in our laboratories ruled out any significant phytoremediation from the growth of three common weed species, most likely due to very low water solubility of the POPs involved. A way that phytoremediation could be enhanced might be to increase the water solubility by encapsulating the soil-bound organochlorine POPs into cyclodextrin complexes. This preliminary study tests this hypothesis by attempting to create chlordane-cyclodextrin host-guest complexes, and gauging the efficacy of the complexation by <sup>1</sup>H and <sup>13</sup>C NMR.

### **Robot Art**

Desmond L. Campbell

Nicholas B. McCamey

Sean P. McKenna

Sean P. Quinn

Matthew V. Shanks

Andrew R. Shores

William M. Siler

Charles L. Wheeler

Paul E. Zarychta

Lauren E. Cagle

Heath W. Henderson

Lindsay E. Sears

Faculty Mentors: Ann Viano<sup>1</sup> and Val Vagardson<sup>2</sup>

Departments of Physics<sup>1</sup> and Art<sup>2</sup>

A robot is an intelligent connection of perception to action, and one whose creation requires a variety of skills in the areas of electronics, mechanics, sculpture, and programming. Students enrolled in the physics / art interdisciplinary course "Introduction to Robotics" have acquired these skills along with an appreciation for robot art by creating autonomous robots that respond to their environment. These robots will be shown and discussed by their artists, and demonstrations of the robots' abilities will take place.

### **A broad spectrum high-copy suppressor of Calcofluor hypersensitivity in *Aspergillus nidulans***

Caroline Sartain

Faculty Mentors: Terry Hill<sup>1</sup>, Annette Teepe<sup>1</sup> and Darlene Loprete<sup>2</sup>

Departments of Biology<sup>1</sup> and Chemistry<sup>2</sup>

In filamentous fungi, hypersensitivity to the chitin-binding agent Calcofluor White (CFW) has been correlated with defects in cell wall integrity. We have identified several mutant strains of *Aspergillus nidulans* that demonstrate the CFW-hypersensitive phenotype. Here we report on the complementation of CFW-hypersensitivity in two of these strains, which carry mutations at separate loci. We have attempted to clone the genes through complementation with *A. nidulans* genomic DNA libraries, and have repeatedly recovered DNA sequences that complement CFW hypersensitivity and contain in common the wild type *A. nidulans* gene AN4897.2. This gene has

been shown by re-transformation to be capable of phenotype rescue for each mutant. However, neither mutant strain contains a mutation in the ORF for AN4897.2, suggesting that the gene acts as a high copy suppressor. The hypothetical translated product of AN4897.2 is an ST-rich intermembrane protein. While the presence of such a strong and “broad-spectrum” suppressor capable of complementing CFW hypersensitivities arising from separate mutant loci presents a problem to cloning genes that affect CFW hypersensitivity, the protein for which it codes presents an interesting new direction for investigation. Efforts are currently underway to establish a phenotype for mutations at this locus and to determine the cellular locus of the protein via GFP tagging.

### **A Microscopic Investigation of Treated Ultrahigh Molecular Weight Polyethylene**

M. Andrew Scott<sup>1</sup>

Terese A. Holm<sup>2</sup>

Carl W. Carlson<sup>2</sup>

Karyn E. Spence<sup>1</sup>

Matt Shanks<sup>1</sup>

Asit K. Ray<sup>3</sup>

Faculty Mentors: Ann Viano<sup>1</sup> and Richard Redfearn<sup>2</sup>

Departments of Physics<sup>1</sup> and Chemistry<sup>2</sup>, Rhodes College; Department of Chemical and Biochemical Engineering, Christian Brothers University<sup>3</sup>

Ultrahigh molecular weight polyethylene (UHMWPE) is one of the most commonly used materials in large human joint prostheses. The combination of its non-reactivity in the body and its mechanical properties make UHMWPE ideal for cartilage replacement in total artificial knee and hip joints. One of this material’s major detriments is that as it wears over the lifetime of the prosthesis, submicron wear particles are liberated which can cause adverse biological reactions such as osteolysis. Post processing of the material with gamma-irradiation and annealing has been shown to reduce the production of these wear particles, while oxidation during aging has detrimental effects. While the effects of these treatments on the macroscopic properties of UHMWPE have been investigated, few researchers have studied their effects on the molecular and microscopic structure. We have used transmission electron microscopy to visualize the crystalline (lamellar) and amorphous regions of the polymer, and measured a “stacking parameter” that quantifies the degree of lamellar freedom in the polymer. These studies were combined with a chemical technique, solid state pyrolysis coupled with gas chromatography-mass spectrometry (GC-MS), which identifies the types and extent of branching and crosslinking. Together, these two methods have provided a complete determination of the microscopic behavior of UHMWPE due to different post-manufacturing treatments (irradiation, annealing, and oxidative aging). The results should provide insight into future material processing to reduce wear in this important artificial joint material. This poster will focus on the TEM method for UHMWPE characterization.

### **The Effect of Pressure upon the Sonoluminescence Phenomenon**

Paul Sinclair

David Johnson

Faculty Mentor: Brent Hoffmeister

Department of Physics

Sonoluminescence is a phenomenon where light is created when sound waves collapse tiny bubbles in a liquid medium. The 50 ps long pulses of light occur at the frequency of the driving sound waves. Theory speculates that the light is created from the localized heating of the collapsing bubble. The goal of our experiment is to construct an apparatus to achieve sonoluminescence and then to measure the change in intensity of light as a function of changes in driving power. The device consists of a 100 mL round bottom flask filled with water and two 25 kHz ceramic transducers mounted on opposite sides of the flask to create a standing sound wave. We intend to measure the power interval over which sonoluminescence occurs and use a photometer to measure the intensity of light produced over this interval.



### **Generation of a recombinant murine herpesvirus containing the Epstein-Barr virus viral interleukin-10 (vIL-10) gene**

Desiree Steimer

Faculty Mentor: Gary Lindquister

Department of Biology

Epstein-Barr virus (EBV), a highly pervasive human pathogen, expresses a unique viral interleukin-10 (vIL-10) gene that has striking homology to the human interleukin-10 (IL-10). vIL-10 has not previously been well characterized because of the narrow host range of EBV. To study the function of vIL-10 and its role in EBV pathogenesis, murine gammaherpesvirus (MHV) infection of mice may serve as a small animal model. The MHV virus lacks a vIL-10 gene, but has sequence homology with EBV as well as similar pathogenesis and symptomology. Previously, plasmid constructs were generated containing the vIL-10 gene under the regulation of two different promoters, pgk and gp150. The gp150 promoter, a MHV late-gene promoter, ideally will produce natural vIL-10 expression levels, where as the promoter pgk will ensure constant levels of gene expression. These plasmid constructs are currently being used to generate recombinant MHV viruses. Once these recombinant viruses are purified and confirmed using PCR, mice will be infected with the virus intranasally and the *in vivo* effects of vIL-10 on viral replication, latency and pathogenesis can be characterized.

### **Synthesis and Characterization of Crosslinked Poly(MMA-co-EGDMA)**

Anne R. Tanner

Faculty Mentor: Richard Redfearn

Department of Chemistry

Often the amount of crosslinking comonomer in commercial polymers is very small compared to other components of a polymer product. The amounts of ethylene glycol dimethacrylate (EGDMA) in poly(methyl methacrylate) (PMMA) can range from 30-40% by weight in contact lens acrylic polymer down to the tenths of a weight percent in plastics used in automotive or bathtub/hot tub plastics. However, only a few hundred ppm of EGDMA in a copolymer with MMA can render the polymer insoluble and intractable for the purposes of obtaining good spectroscopic data by <sup>1</sup>H and <sup>13</sup>C NMR, for example. Pyrolysis GC-MS has the advantage of providing a quantitative determination of EGDMA incorporated into the polymer, even at low levels down to 200 ppm (0.02 wt% or approximately 0.01 mol% based on total polymer) in poly(MMA-co-EGDMA) copolymers. Also, “gel state” NMR can also be effective in showing tacticity of the copolymer with significant levels of crosslinking. This poster will illustrate the reproducible synthesis of poly(MMA-co-EGDMA) polymers and their characterization by “gel state” NMR and pyrolysis GC-MS.

### **Analysis of Courtship Behavior of *Giraffa camelopardalis reticulata***

Melanie Woods

Faculty Mentor: Tony Becker

Department of Biology

In the fall of 2004 and spring of 2005, five reticulated giraffe (*Giraffa camelopardalis reticulata*) were observed at the Memphis Zoo in Memphis, Tennessee. The objective of this study was to determine if the male giraffe, Bobai, demonstrated courtship behaviors according to preference for a specific female giraffe. The hypothesis was that Bobai would demonstrate a preference for the youngest female, Abby. The courtship behaviors that Bobai demonstrated toward the females were observed throughout the day. There were thirteen courtship behaviors to be observed: head butt, urine sniff, urine sampling, flehmen, nuzzling, circling, cut-off, stroking, kick, following, pacing, code pink, and copulation.

**Natural and Social Sciences Posters – Session 2: Social Sciences posters**  
***Frazier Jelke Lobby, beginning at 2:00 pm until 4:00 pm***

***Session Chair: Tom McGowan, Department of Anthropology/Sociology***

***All posters will be available for viewing from 1:00 to 4:00. At least one of the student collaborators will be in attendance and available for discussion from 2:00-4:00 pm. If a specific collaborator is presenting, that coauthor name is underlined.***

**Recognizing Diversity: Students' Experiences and Opinions on Diversity Acceptance in a Small Liberal Arts College Environment.**

Michael Bray

Marisa Adams

Lindsay Sears

Faculty Mentor: Anita Davis

Department of Psychology

Prior research examining diversity amongst college undergraduate populations tends to focus primarily on racial diversity or sexual orientation (Ancis, Sedlacek, & Mohr, 2000; Evans & Broido, 2002; Hurtado, 1979; Loo & Rolison, 1986; Pewewardy & Frey, 2002; Phiney & Haas, 2003; Sedlacek, 1987; Waldo, 1998). These studies have also generally served to gauge the atmosphere of the campus climate in general or look at potential outcomes such as drop out rates or impaired class performance and learning difficulties due to these differences (Hansman, Spencer, Frant, & Jackson, 1999; Hurtado, 1979; Loo & Rolison, 1986). Additionally these studies have typically used traditional survey data analyzed via quantitative statistical analysis. In this study we wish to examine the general atmosphere and acceptance of various types of diversity within a small liberal arts college undergraduate community. Specifically we will analyze students' responses to the two following open ended prompts "Please describe one positive experience that you have had with someone from a different background" and "In your opinion, what changes, if any, need to occur at our college for it to become a community in which diversity is valued and welcomed". Qualitative coding of the students' responses will then be guided by the work of Stauss and Corbin (1990). Findings will shed light on how students' define diversity and in what context students report positive experiences with diversity. Suggestions for students' perceptions of how to initiate change will also be discussed.

**Sex Can Wait: An Evaluation of Abstinence-Only Education Programs**

Brynnan Cox

Faculty Mentor: Anita Davis

Department of Psychology

Research findings indicate that over the past years, there has been a significant increase in sexual activity among adolescent males and females between the ages of 12 to 18 (Lerner, 1995). Studies suggest that there are many factors that lead to adolescent sexual activity, including biological, demographic, psychological, social, and educational factors (Smith, 1997; Meschke, Zweig, Barber, & Eccles, 2000). Many programs have been designed to promote abstinence among adolescents through increasing knowledge about puberty, sexuality, and abstinence (Devaney & Rossi, 1997; Moore & Sugland, 1997). The present study examined the effectiveness of an abstinence-only program in educating adolescent males and females on issues concerning sex through a pre-prom seminar. The seminar focused the program on educating participants in biological, psychological, and social factors that can lead to premarital sex. Participants completed pre- and post-tests in order to assess gains in educational awareness. In the present research, it was hypothesized that if the program was effective, then there would be a significant increase in sexual education awareness among the participants. The results of the research confirmed the hypothesis, suggesting that the abstinence-only program did in fact increase sexual education awareness. Limitations of the research and suggestions for further programs and research are discussed.

## **Types of Natural Mentor Relationships: Implications for Depression and Educational Outcomes**

Elizabeth de Mahy

Megan O'Brien

Faculty Mentor: Anita Davis

Department of Psychology

Past research has identified the presence of a natural mentor, a non-parental figure who provides support and guidance to a young person, to be a contributing factor to adolescents' resiliency (Werner & Smith, 1982). Numerous studies, examining the effects of mentors, have demonstrated that having a mentor is correlated with lower levels of depression and more positive school outcomes (Rhodes et al., 1992; Zimmerman, 2002). The present study explored the effects that different types of mentors have on adolescents' school attitudes and levels of depression. Participants were 477 African American students from an urban high school who completed a survey measuring variables such as educational plans, present feelings about school, depression, as well as presence of a mentor and relationship to that mentor. Mentor relationships were grouped into the following categories: immediate family, extended family, school authority, community member, and friend. Analyses of variance revealed that participants with natural mentor relationships of friend reported higher levels of depression as compared to participants with other types of mentor relationships. Additional ANOVAs showed that participants with unrelated mentors reported more positive feelings about school than participants with no mentor or related mentors. Results involving the type of mentor relationship will be discussed in light of implications for participant depression and educational outcomes.

## **The Symbiosis of Law and Insurance**

Alison French

Faculty Mentor: Charles Menifield

Department of Political Science

President Bush has made it clear that tort reform is at the top of his agenda. The administration's desire to pass a federal law placing a cap on non-economic damages has only added fuel to what already was a fire. This cap would supersede any previously enacted reforms at the state level. Over the past three decades, the nation has seen three distinct periods of a malpractice "crisis" where malpractice premium levels skyrocket. I hypothesized an increase in malpractice payouts could be attributed to high premium rates; thus, placing a cap on non-economic damages would reduce costs to the insurer and in turn, would reduce malpractice premiums. My hypothesis turned out to be incorrect. The rise and fall of malpractice premiums can be attributed to the state of the economy, rather than malpractice payouts. Reforms that cap non-economic damages prove ineffective in reducing premium rates. Defense costs are the number one expense to the malpractice insurer, and studies have shown that an overwhelming majority of claims filed are without merit. Reforms must focus on limiting the amount of defense costs spent on frivolous claims. Certificates of merit weed out many claims without merit. Future studies should look at the possibility of health courts.

## **An Evaluation of a Substance Use Prevention Program for the Boys & Girls Club**

Rene Weller

Will Lancaster

Paige Gardner

Faculty mentor: Anita Davis

Department of Psychology

Youth substance use remains prevalent and is a serious national concern (Sale, Sambrano, Springer, & Turner, 2003; SAMHSA, 2003). Many prevention programs have been developed to alleviate this problem, but it is also necessary to evaluate these programs in order to determine their effectiveness (Pierce & Shields, 1998). The current study is an evaluation of the *SMART Moves* program which is used at the Boys & Girls Clubs of America. *SMART Moves* consists of three programs for youth of different ages. Five Memphis clubs were involved in this evaluation. Youth participating were given a pre-test and post-test to assess changes in their knowledge of drugs and alcohol as a result of participating in this educational program. Differences in these test scores will be discussed by club, age

group, gender, and attendance. Recommendations for future research and possible ways to improve these prevention programs will be discussed.

### **Literacy and Literary Voice in Two Inner-City Schools**

Meredith Guillot

Faculty Mentor: Marsha Walton

Department of Psychology

Currently, many of America's public schools are struggling with a lack of resources, ranging from budget deficits and outdated resources to a shortage of teachers. In Tennessee, 74% of fourth graders are reading below their grade level. In Louisiana, this number climbs to 80% and in Mississippi, it has reached as high as 82% of fourth grade children reading below their grade level (<http://www.childrensdefense.org>). These statistics reflect a horrible deficit in our children's literacy skills. However, previous research has shown that many of these students, particularly the African-American students, are coming to school with a strong storytelling tradition (Champion, 2003). If children are coming to school with these storytelling skills in which they display a complex use of expressive language, why are these children showing such a deficit in their literacy skills? A few of the previous studies on narrative have focused on the effects of oral narrative on the development of literacy in young children (Griffin, Hemphill, Camp & Wolf, 2004). The purpose of this study is to use qualitative data from inner-city children's narratives of conflict to examine how measures of literacy, a traditionally schooled skill, and literary voice, a skill that includes features present in a rich storytelling tradition such as humor, dialogue, metaphor, etc. relate to each other. We plan to explore the ways in which narrative can facilitate cognitive development, including literacy and perspective-taking skills.

### **Does Religion Matter? A Look at the Roles of Religious Coping, Self-Esteem, and Well-Being in Adolescence**

Amanda Hearst

Faculty Mentor: Ronke Tapp

Department of Psychology

Substantial data detail how personal religious beliefs influence and are influenced by aspects such as one's personality or interpersonal relationships. Many reports show significant trends and positive links between religion and psychosocial dispositions, such as self-esteem and well-being (Koenig, McCullough, & Larson, 2001; Hood, Spilka, Hunsberger, & Gorsuch, 1996). The majority of research on religious coping, however, focuses on adults or on adolescents who have no significant life stressors. Adolescents are faced with an increasing amount of demands and stress. The extent to which coping styles are skillfully employed in part determines adjustment into adulthood. The purpose of this study is to assess the ways in which adolescents who are at risk of behavioral and psychological distress use spirituality to cope with life stressors. Approximately forty adolescents, who are in treatment due to participation in delinquent behaviors, will be studied. The goal of this study is threefold: (1) to obtain a better understanding of how adolescents use religion to cope with life stressors, (2) to learn what influences religious coping style, and (3) to understand the impact religious coping style, self-esteem, and well-being have on each other. Results indicate that one's sense of well-being is directly affected by certain religious coping styles and by the level of self-esteem. Furthermore, analyses revealed that the level of self-esteem and religious motivation directly affects the type of religious coping style utilized. Discussion focuses on the implications of results as they relate to at-risk adolescents.

### **Assessing Campus Climate and Attitudes Towards Gays, Lesbians, Bisexuals and Transexuals (GLBTs)**

William Seth Johnson

John Oscar Kizer

Faculty Mentor: Anita Davis

Department of Psychology

Previous research exploring campus climates towards the Gay, Lesbian, Bisexual, Transexual (GLBT) community has been conducted on large, northern, public universities and found that a large number of students hold anti-GLBT attitudes. The present study was conducted on a small, southern, liberal arts college as a means to

provide a more complete understanding of the U. S. campus climate. Results of the study suggest that anti-GLBT attitudes are present on small, southern, liberal arts institutions. Results also suggest that women are more tolerant and supportive of GLBT issues than are men. Data suggests that exposure to various forms of diversity corresponds to more pro-GLBT attitudes. High religiosity was found to be highly correlated to anti-GLBT attitudes. The results of this study are used to make recommendations for changes in campus climate.

### **Validating the Name-Letter Effect as a Measure of Implicit Self-Esteem**

Lori Meadows

Ben Jorge

Faculty Mentor: Christopher Wetzel

Department of Psychology

Recently self-esteem researchers have discovered a component of self-esteem that lies within the unconscious, known as implicit self-esteem. It has been shown that implicit self-esteem exists independently from explicit self-esteem, or the level of self-esteem that exists in awareness. Although the field of implicit self-esteem research is fairly new, there are various instruments used for its measurement. One of these instruments, the name-letter effect, has been shown to have low reliability and weak validity. The purpose of the present study is to use a subliminal self-esteem manipulation in order to test the validity of a new way to assess the name-letter effect. We will compare this measurement to another implicit self-esteem measurement, the Go/No-go Association Task, which has been previously validated for measuring implicit prejudice. We hypothesize that levels of implicit self-esteem will change, based on the manipulation condition (positive or negative), while levels of explicit self-esteem will remain constant, providing further evidence that implicit self-esteem is a construct separate from that of explicit self-esteem.

### **Perceptions of Racism at a Liberal Arts College**

Rachel Novotny

Lissa Waldo

Stephanie Albury

Lindsay Spellings

Faculty Mentor: Anita Davis

Department of Psychology

It is hypothesized that African American students perceive a greater occurrence of racism. In her study, McCormack (1998) found an increase of racism in both academic and social settings on college campuses from 1988-1996. However, most studies have been conducted at large universities; it would therefore be insightful to conduct research at a small college. We hypothesized that Black students will perceive higher levels of racism on campus, and experience more negative academic and social climates in comparison to their White peers. To test this, 132 randomly chosen students filled out an online questionnaire. Results found that Black students perceived higher levels of general racism on campus, and perceived more negative academic and social climates. Further research on diversity training and white guilt are the first steps to alleviating problems of racism.

### **Assessment of the Effects of Community Service and Service Learning on College Students' Racial Attitudes**

Lucy Waechter

Maureen Miller

Faculty Mentor: Anita Davis

Department of Psychology

Students' racial attitudes were assessed by survey prior to and following service experience, and personal interviews were conducted with students who serve. Previous research has shown that involvement in service can influence students' racial attitudes, as students often have interracial contact with the individuals they serve (Moely et al., 2002; Myers-Lipton, 1996). One specific factor that has been shown to contribute to a positive shift in racial attitudes is discussion or critical reflection about service experience, and one context in which this arises is in service learning courses. These courses seek to combine experiential learning with coursework in order to meet community needs, enhance students' civic responsibility, and give students a broad appreciation of the discipline (Bringle & Hatcher, 1995). The current research aims to identify factors that facilitate transformative service

experiences at a small liberal arts college, such as motivation to serve, attributions about recipients' life situations, community connection, and discussion. Special attention will be paid to student perceptions and experiences of class discussion about issues of race, socioeconomic status, and service. Strategies that maximize the benefits students receive from their service experiences will be suggested.

### **The Effects of Diagram Complexity on Recall of Science Texts**

Latasha Harris

Kristina Dean

Albani Walker

Faculty Mentor: Hyun-Jeong Joyce Kim

Department of Psychology

In an effort to change reputations of science courses as being really difficult, researchers continue to look for ways to improve how science is taught in the classroom. Previous research has shown that diagrams are effective in facilitating the learning of difficult texts. Thus, the current study examined the effects of diagram complexity on student recall of science texts. Participants were randomly assigned to four diagram conditions: complex (pictures, labels and text); intermediate (picture and labels); simple (picture only) and the control group. After taking the Reading Comprehension Test and Prior Science Knowledge pretest, the participants read ecology passages with their corresponding diagrams and took a post test. There were no statistical differences in diagram condition on recall although we did find a trend in the scores. Theories that might explain our insignificant findings are discussed in our conclusion. Reading Comprehension and Prior Science Knowledge were both significant. High reading and prior knowledge scores yielded high scores on the post test as individual differences attribute to students ability to learn. There are some interesting research findings/theories that might explain what we found. Recommendations for this study to make an impact on science education in schools are further discussed.

### **Special Sessions:**

*These are all nonjuried sessions featuring scholarship from Rhodes students who are studying specific topics like animal behavior, or are participating in specialized programs like the Storm Water Environmental Education Program (SWEEP).*

### **Poster Session for Molecular Biology: Bioinformatics projects**

*Frazier Jelke Lobby beginning at 1:15 pm until 2:30 pm*

*Session organizer: Gary Lindquister, Department of Biology.*

*This session will run concurrently with the juried Natural and Social Sciences Poster Sessions. All posters will be available for viewing from 1:00 to 4:00. At least one of the student collaborators will be in attendance and available for discussion from 1:15-2:30. If a specific collaborator is presenting, that coauthor name is underlined.*

### **Lynx Genome Project: Sequencing and Analysis of Ribosomal Protein S3a**

Jeff Freyder

Matthew Law

The explosion of the human genome has contributed to the sequencing of many animals. This explosion also includes the sequencing of the Lynx genome. To sequence the Lynx genome, cDNA clones from the Eurasian Lynx fibroblast cell mRNA were used. These were chosen because it is possible to capture a picture of the specific proteins that are being used by these cells. These mRNAs are used because they have already proceeded through the spliceosome complex and have coding sequences expressed. The Vector NIT 7 program was used to determine the sequence and to find correlating sequences.

### **Identification and Isolation of RAD23 Homologue in *Lynx lynx* Fibroblast Genome**

Michael Spilman

Michael Burke

Recent developments in genetics and molecular biology have lead to a current explosion of genome mapping. To that end, the *Lynx lynx* genome has never been investigated and it was the intention of this study to take the first steps towards the complete mapping of the Lynx genome. Genomic libraries were derived from Eurasian Lynx fibroblast cells, which are found ubiquitously in the connective tissues and produce and secrete collagen fibers integral to the extra-cellular matrix character for this tissue. These genomic libraries were derived from preparation of cDNA clones from the expressed fibroblast RNA. Here we have isolated the encoding sequence of a RAD23 homologue within the lynx fibroblast cDNA library and analyzed the open reading frame (ORF) against RAD23 homologue against several phyla. The high level of conservation found across eukaryotic phyla may be attributed to the integral role of RAD23 proteins in DNA nucleotide excision and repair (NER)<sup>1</sup>.

### **Sequencing Cytochrome C Oxidase Subunit V1b in the Lynx**

Bethany Drehman

Kate Key

Kelly Reed

Technological innovations coupled with the techniques of molecular biology now allow for the DNA sequencing of an organism's entire genome. DNA sequencing provides important quantitative information that can be used to correlate the location of a gene with its function. It has also become an important tool in developing evolutionary models via phylogenetic analysis. Also, an understanding of which amino acids are key to the protein's structure based on the conservation of them between species can be gained. In this research, individual cDNA clones from Eurasian Lynx fibroblast cell mRNA were sequenced and analyzed to identify the actual protein coding sequences. The sequence coding for cytochrome c oxidase subunit VI b was identified through this research which is part of the Lynx Genome Project. Cytochrome c oxidase structure, function, and evolution is discussed.

### **Sequence Analysis of the *Lynx lynx* 40S Ribosomal Subunit S3a and the Study of its Potentially Dual Nature**

Aaron T. Creek

Taylor C. Brown

In furthering the cause of creating a database for the Lynx Genome Project, we obtained the sequence for the *Lynx lynx* ribosomal protein S3a using comparative data from the National Center for Biotechnology Information. Our research explains the generic function of this protein as an integral member of the 40S subunit of a eukaryotic ribosome and suggests the importance of ribosome assembly and its conserved evolutionary history among eukaryotes. We also explore alternate functions of the protein as discussed by I.G. White. The thought is that the complexity of a ribosome stems from the addition of preexisting proteins to the rRNA core. This research also serves the dual purpose of analyzing the ribosomal protein S3a gene in *L. lynx* and comparing it to the same gene in other organisms. As a fellow "cat," the derived sequence for ribosomal protein S3a from *L. Lynx* is most closely related to the members of the genus *Felis*.

### **Role of Serine hydroxymethyltransferase (SHMT) in Glucose Metabolism**

Amy Leggette

Sonia Singh

The protein serine hydroxymethyltransferase (SHMT) catalyzes the conversion of glycine to serine by enzymatic addition of a hydroxymethyl group during glucose metabolism. This reversible reaction requires the coenzymes tetrahydrofolate (THF) and pyridoxal phosphate. Serine is finally converted to pyruvate via another enzyme (Nelson and Cross, 2005). SHMT is also a major source of one-carbon units for cellular metabolism (Scheer, et. al, 2005). Research on sheep fetuses has shown that the conversion of serine to glycine is crucial for major developmental events (Lewis, et. al, 2005).

### ***Lynx lynx* Genome Analysis: Phylogenetic Analysis S6 Ribosomal Protein**

Matthew D. Cain

Ross W. Hilliard

Ribosomal protein S6 (RPS6) is a small protein which is a subunit of the ribosome, specifically the smaller 40S complex (highlighted red in the structural diagram at right). The protein is highly phosphorylated *in vivo*. This phosphorylation, occurring on a number of serine residues on the C-terminus, is facilitated by various protein kinases induced by growth factors, tumor promoting agents and mitogens. It is believed to be involved in the translation of a particular class mRNA involved in cell growth and proliferation. We present data obtained from studies of a *Lynx lynx* cDNA library and comparisons of sequences obtained to the RPS6 protein sequence in multiple organisms.

### **Animal Behavior “Mini-Symposium”**

***Frazier Jelke Lecture Hall C, beginning at 1:00 pm until 3:55 pm***

***Session organizer and Chair: Tony Becker, Department of Biology.***

#### **1:00-1:25 Cougar Cub Play Behavior: Hunting Practice or Innocent Fun?**

Adam Brewer

Krista McClain

Ethan Stranch

Nick Stutzman

Faculty mentor: Tony Becker

Department of Biology

We plan to study the cougar cubs at the Memphis Zoo to determine whether their play behaviors are associated with the development of hunting skills that would be needed by full-grown cougars in the wild. While there are three cubs at the zoo, Rainer, Seattle, and Olympia, cougars typically live solitary lives when full grown in the wild. Thus we propose that the play behaviors exhibited between the cubs are practice for solitary hunting of prey. We plan to observe their behaviors in the afternoon when they are most playful and categorize their behaviors as “hunting” and “non-hunting.” We predict that we will see more hunting behaviors exhibited rather than non-hunting behaviors that will suggest the purposeful nature of play behavior as a developmental tool used by the cubs as they grow into solitary predatory animals.

#### **1:30-1:55 Puzzle Solving Ability of *Pan paniscus***

Christine Bass

Hennessy Howell

Elizabeth Nabers

Faculty Mentor: Tony Becker

Department of Biology

Our research group studied the puzzle solving ability of the Bonobo (*Pan paniscus*) population at the Memphis Zoo. We presented the population, consisting of three females and one male, with several variations of puzzle feeders and observed their puzzle-solving abilities. During each observation session, the sampling of all occurrences for behavior related to the puzzle feeders was recorded. Related behaviors included, but were not limited to: examination of the puzzle feeder, attempted opening of the puzzle feeder, successful opening of the puzzle feeder, and playful activity involving the puzzle feeder. The time spent demonstrating each of these behaviors as well as the time spent away from the puzzle feeder was recorded for each animal. We hypothesized that each puzzle would be successfully solved by at least one female of the population. We also postulate that the remaining animals will learn from the behavior of the dominant female and consequently solve their own puzzle.



1:55-2:15 **Break**

2:15-2:40 **Displays of Dominance Among Female African Elephants**

Kristen Andrews

Stephanie Norris

Evan Weinberger

Faculty Mentor: Tony Becker

Department of Biology

Our research group investigated the expression of dominance between two female African, *Loxodonta africana*, elephants of different ages at the Memphis Zoo. This was done using the method of sampling all occurrences of some behaviors. We observed the older elephant demonstrating her dominance over the younger elephant. Acts of dominance observed included replacement, takeover, charging, and bumping. Another category, other, was used to group unclassifiable behaviors, i.e. expressions of dominance not previously specified. We also observed acts of subordination from the younger elephant toward the older one. We expect to see a clear show of dominance by the older female elephant.

2:45-3:10 **Relationship of Temperature and Orientation Towards the Sun in Reticulated Giraffes.**

Courtney Cockerell

Morgan Reed

Umair Saleem

Faculty Mentor: Tony Becker

Department of Biology

From sweat glands that aid in evaporative cooling, to the behavior of dog's panting to keep cool, thermoregulation is a vital part of an animal's physiological and behavioral mechanisms that helps maintain homeostasis. One very common type of thermoregulation in many types of mammals is the absorption of heat from solar radiation. The Reticulated Giraffe (*Giraffa camelopardalis reticulata*) is a very large mammal that needs to regulate its body temperature effectively, especially because of its large surface area. After observing the animals for several weeks, we hypothesize that as the temperature rises, Reticulated Giraffes will have less of their lateral body surface area oriented to the sun. The opposite is also assumed at lower temperatures. This behavior study will help understand whether Reticulated Giraffes have a behavioral mechanism for thermoregulation.

3:10-3:30 **Break**

3:30-3:55 **Handedness in Giant Pandas, *Ailuropoda melanoleuca***

Erick Isaacson

Adam Master

Ed Smith

Faculty Mentor: Tony Becker

Department of Biology

Our research group used focal sampling to study the eating habits of giant panda, *Ailuropoda melanoleuca* looking for paw preference. We used an ethogram obtained from the San Diego Zoological Society, recording habits such as biting, making wads, and stripping stems, and making special note of the paw the panda used to perform each action. Each action repeated in succession was counted as a single event. We then tested the null hypothesis that there is no preference for a particular paw using the appropriate statistical analyses.

**Environmental Research: Cypress Creek Oral Session**

***410 Rhodes Tower, beginning at 1:00 pm until 3:40 pm***

*Session organizer and Chair: Carol Ekstrom, Department of Physics (Geology).*

*This is the fifth year of a special session focusing on the local environment. The research projects for Environmental Geology 214 are sponsored by a grant from the Associated Colleges of the South's Environmental Initiative, Campus as a Laboratory for Sustainability Alliance.*

**1:00-1:20 Cypress Middle School: A Walk Through Time**

Cori Anderson

Jazmin Miller

Frannie Shellman

Faculty Mentor: Carol Ekstrom

Department of Physics

Sponsor: Environmental Geology 214

The history of Cypress Middle School has a strong impact on the community's perception of the school. We focus on the physical problems of flooding in the 1970s, soil contamination, and remediation in 2004. We also explore the educational progress of the school as a whole, drawing on information from TCAP scores, student enrollment, school programs, and community participation. Our data concerning both the school's gradual changes and the community's perception of the school over time are derived from public records, personal interviews, and VECA.

**1:20-1:40 Chlordane, Heptachlor, and Aldrin in the Cypress Creek Floodplain**

Justine Guthrie

Helen Mathews

Ben Hobbs

Faculty Mentor: Carol Ekstrom

Department of Physics

Sponsor: Environmental Geology 214

The pesticide dieldrin has been the focus of most of the data analysis of the Cypress Creek floodplain, but tests performed from 1999 to 2002 indicate high and unsafe levels of the pesticides chlordane, heptachlor, and aldrin in the same areas. All uses of chlordane were banned in 1988 because of health risks including anemia, cancer, kidney damage, and liver damage. Most uses of heptachlor were banned in 1978 because of health risks including nervous system damage, liver damage, and cancer. All uses of aldrin were banned by the EPA in 1987 because of similar health risks including convulsions and death. The tests performed in the Cypress Creek indicate not only the presence of these dangerous chemicals, but also a correlation between the locations of each of the four pesticides present in the soil. We have compiled the information concerning the location and levels of each pesticide in the soil into a GIS map that will reflect the correlation between the four pesticides.

1:40-2:00 **Dumping and Flooding of the Cypress Creek Flood Plain**

Alex Conforti

Eliza Hanson

Leonard Hobson

Faculty Mentor: Carol Ekstrom

Department of Physics

Sponsor: Environmental Geology 214

Cypress Creek is located in the flood plain of the Mississippi as are many houses in the VECA and Hollywood-Springdale neighborhoods. In the 1950's chemical dumping from local chemical plants took place contaminating the water and soil along the creek. In this project we examine when dumping occurred and relate it to the flooding of the Cypress Creek. By examining the archives of flooding via the Cypress Creek Pumping Station, we can see how often the area was flooded and to what extent. This data gives a better understanding to how much of the VECA and Hollywood-Springdale area is contaminated by the chemicals that were dumped into the creek during the 1950's, 1960's, and 1970's.

2:00-2:20 **Break**

2:20-2:40 **Conductivity Meter Survey of the Cypress Creek Floodplain**

Scott Harvey

Nicholas Lewis

Faculty Mentor: Carol Ekstrom

Department of Physics

Sponsor: Environmental Geology 214

Cypress Creek floodplain is contaminated with pesticides from past dumping by chemical companies located along the creek. The 52.5 acre floodplain is large and expensive to sample completely. We are proposing that a conductivity meter survey of the floodplain can identify area of high pesticide content based on particle size composition of the soil. We will compare our data with the extensive sample analyses that Velsicol Chemical Corporation will release this spring. We hope to conclude that the conductivity data correlates to pesticides levels, and therefore the instrument can be used as a predictive tool. We have used GPS to overlap the grid previously completed by Velsicol Chemical Corporation.

2:40-3:00 **Case Histories**

Joey Garrison

Clayton Garner

Gifford Loudon

Faculty Mentor: Carol Ekstrom

Department of Physics

Sponsor: Environmental Geology 214

Velsicol Chemical Corporation claims to have a strong commitment to social responsibility, maintaining a dedication to the environment, health, and safety of the community. However, as this report reveals, Velsicol has not acted in accordance to its company policy in the Memphis area. We will document that Velsicol has largely operated in a way that is not socially responsible at this site and in other areas in the United States. As recent history has shown, Velsicol has attempted to improve their actions. Perhaps the information uncovered through our examination of Velsicol's social policies will encourage the continued interaction with the local communities in Memphis and in other areas.

3:00-3:20 **Remediation Technologies**

Alex Chambers

Faculty Mentor: Carol Ekstrom

Department of Physics

Sponsor: Environmental Geology 214

This project outlines the innovative and established treatment technologies for remediation of contaminated soils. It looks at isolation methods, separation methods, and destructive methods as well as *in situ* versus *ex situ* processes. These methods along with soil remediation case studies are used to assess possible and appropriate remediation technologies for the Cypress Creek Floodplain.

3:20-3:40 **Lick Creek Water Quality**

Debbie Banerjee

Chelsea Castiglioni

Marcus Falion

Faculty Mentor: Carol Ekstrom

Department of Physics

Sponsor: Environmental Geology 214

Lick Creek, a small urban storm water drainage system, affects the health of its many local neighbors. It is essential that we test the water quality of the creek be maintained. We will test water quality to determine if Lick Creek complies with the legal limits of an urban storm drain, determine if any companies release effluents into the creek and make a GIS map of its watershed and drain locations.

**Community Involvement in Environmental Research:**  
**SWEEP: Storm Water Environmental Education Project**

*Faculty Mentor for SWEEP: Carol Ekstrom, Department of Physics (Geology)*

*SWEEP is an after-school program that partners Rhodes College and Cypress Middle School to focus on science and environmental education. It was funded by an EPA grant for 2002-2003, an Associated Colleges of the South, Campus/Community Partners grant for 2004, a Congressionally Directed Grant for 2004-2006, and a HUD COPC grant for 2005-2007. Rhodes students Katie Holtkamp, Lorryne Mallot, Elza Crocco, and Richard Johnson '04 and students in Geology 214 have worked with Cypress SWEEP students on a variety of projects.*

Our SWEEP partners are Cypress Middle School science teachers Mrs. Brenda Prittle, Ms. Kimberly Jones; Cypress Middle School Principal Mr. Raymond Vasser; Cypress Middle School students Jerome Bolton, Fiesha Brown, Shaloma Condon, Terry Donald, Jessica French, Sierra Harris, Arianna Jones, Anntanise Lewis, Rodrequize Mcatee, Genita Mitchell, Roderick Moore, Kai Owens, Demetrius Pirtle, Lavla Robinson, Rosa, Curnessia Sanders, Walterina Settie, Erica Settie, Chris Smith, Brandon Wallace, Sankeisha Washington, Jessica Wiley, Dangelous Williams, Ebony Williams; A.K.A. Sorority; Dr. Alfred Hall, Memphis City Schools; and Mr. Tom Lawrence and Sharon Gordon, City of Memphis.

**Lobby by Frazier Jelke Room 143, and Frazier Jelke Amphitheatre**

2:30-4:00 **Models of Storm Drains, and Posters in F J Lobby near F J 143**

3:40-4:00 **SWEEP Skit and Songs in F J Amphitheatre (rain location: F J Lobby)**

## **Community Research: The Urban Studies Charrette**

### ***Orgill Room in Clough Hall.***

***Session Chair: Carla Shirley, Department of Anthropology/Sociology***

***Faculty Mentor: Michael Kirby, Urban Studies Program***

***Posters will be available for viewing and students available for discussion from 12:00 noon - 1:00 pm.***

***This is a special session sponsored by the Urban Studies Program. The term “charrette” signifies an intense effort to investigate a problem and find possible solutions. The projects reflect fieldwork in Memphis and represent issues related to urban social, political, and environmental policies.***

### **Parks and Greenspaces in Hollywood Springdale**

Caroline Fabacher

Eliza Hanson

Stephanie Juchs

Rebekah Kuhn

This project focused on examining the parks/greenspaces in the Hollywood-Springdale area. We evaluated the quality of parks in the area and met with city officials to discuss the process of creating new parks or improving existing parks. Census information for trends in population and the project determined the number of park users. Others will be able to create parks and greenspaces in the Hollywood-Springdale area using this information.

### **Community Building Organization in Hollywood Springdale**

Kris Schwetye

Shelton Oakley

Rebecca Kynes

Janelle Klein

Mia Norman

Our ultimate goal is to contribute to a feeling of collective efficacy in the neighborhood just north and east of the Rhodes campus, the Hollywood Springdale area. We have written a survey with questions whose goal is to find out from residents the strongest and weakest aspects of their neighborhood. Questions on the survey will allow respondents to address their own concerns, such as physical condition, and their relationships with other residents of the Hollywood Springdale area. We found that there is a general interest in a newsletter, which is the first step in creating a community organization. Since there is interest we have, in conjunction with several community leaders, written a newsletter whose goal is to become a forum for the neighborhood to address issues. In conducting this research, we have also furthered the ongoing relationships in the Rhodes/Hollywood Springdale partnership.

### **The Dirty Dozen- Action or No Action? Code Enforcement in the City of Memphis**

Ashley Crosland

Code Enforcement is the regulation and implementation of the City of Memphis Ordinances in regards to residential properties. Vollintine Evergreen Community Association, a neighborhood organization, serves as the mediator between the property owners and Code Enforcement for the City of Memphis. In the VECA area, research has been conducted in order to analyze the progression of code violations on residential properties. VECA has attempted to address twelve properties, The Dirty Dozen, with high aspirations for the removal of code violations. In recent years, Code Enforcement for the City of Memphis has lacked sufficiency. The relationship between the code violator and the action from the City of Memphis, at various points, has become nonexistent. Though the

implementation of code enforcement has intermittently changed, the impact of code enforcement has allowed community involvement and advancement. The VECA community experiences increased morale among the residents and property owners by the beautification of residential properties.

### **Targeting Today's Youth: Stopping Domestic Violence Before It Starts**

Emily Jackson

Julia Stribling

Ashley Wells

Kasharah King

We address the problem of domestic violence in the low income urban area of Hollywood Springdale. Many experts recognize that domestic violence is a cycle passed from parents to children. Mapping crime with Crime Mapper showed that from June 2004 to February 2005 ninety-seven domestic violence related crimes were reported. Non profit organizations, like The Exchange Club, that target treating child victims of domestic violence believe that parents unknowingly pass these behaviors to children. The group focused on education of young people concerning domestic violence. We attended a domestic violence forum as well as contacted the non profit organization The Exchange Club. We organized a fun event geared towards middle school aged children in the Hollywood Springdale area. The children enjoyed pizza, games, and an interactive program involving domestic violence. We believe that fun and education can raise awareness about the importance of this issue in the community.

### **Greater Memphis Greenline**

Jane Anne Miller

Colin Schultenover

Cynthia Pfohl

Dana Simonton

We have been examining the Tillman section Greater Memphis Greenline and the process of converting it into a walking/biking trail for public use. The Greenline is an old railroad that runs through the middle of Memphis starting at the Poplar – Union overpass and extending into Cordova. The section that we examined at is the western, Midtown, area. Our research examined the characteristics of the area and viewed potential ways for the conversion of the rail into a useful trail. Our task was to indicate different possible trailheads for the line. We thoroughly investigate the trailheads and their surrounding areas: crime, litter, and accessibility based on our observations from fieldwork. We reported our findings to the Greater Memphis Greenline committee. We provided information that will help formulate the decisions made about the Greater Memphis Greenline. Ultimately we hope that the Greenline will be a place where community members (and Rhodes students) can enjoy outdoor activities.

### **The Arrest of School Children on School Grounds**

Jordan Wood

The purpose of this study is to examine the arrests of school children on school grounds. Data from Juvenile Court was examined to determine trends regarding types of arrests and variations among schools. A policy analysis suggests how police should be used within the school system and what changes, if any, should be made in current policy. Interviews have been conducted to gain knowledge about the support of these policies and range from the administration that created the policy to the schools and police officers who carry them out.

### **Smart Plan for Hollywood Springdale**

Traci Allen

Andrea Durham

Justin Guthrie

Carson Irwin

Rebecca Williams

In the Smart Plan Project we are addressing the problem of the overall appearance, safety and use of the Hollywood Springdale area, specifically the section of Hollywood extending from the Missouri Pacific Railroad to Chelsea Street. In order to find out how much the area is currently used, members of the group have observed and identified the number of people walking in this area on different days of the week at different times. In our results

we found that the area is both highly used by pedestrians, but also a very busy, somewhat unsafe traffic area. In collecting this data, we are identifying the problems existing in the area that take away from walkability, safety and overall attractiveness. Upon examining this data, we are then proposing our plan for the changes that will attain the overall goal of making this area one that is attractive not only to the residents of the neighborhood but those outside of the area. We hope that our proposal will be helpful to the neighborhood and its residents by offering cleaner streets, less traffic, and greater walkability among other things.

### **RHSP Tutoring: A Tale of Two Schools**

Becky Saleska

Cypress Middle School and Springdale Elementary, both located in the Hollywood-Springdale community, have entered into partnership with Rhodes College and other partners through RHSP. The educational component of RHSP has initiated separate tutoring programs at Cypress and Springdale in order to offer students from lower-income backgrounds increased access to the educational resources they need to succeed. The programs were tailored to the schools' individual needs based on the recommendations of their respective principals and "Our Children Our Future." Ideally, every student at Cypress and Springdale would have access to the 1) positive role model and 2) one-on-one academic help that can be provided via tutoring. Although we are far from accomplishing this goal, the administration at both Cypress and Springdale have commented on the difference Rhodes tutors have made in the academic/social behaviors exhibited by those students receiving tutoring through our programs.

### **Greater Memphis Greenline: High Point Terrace**

Dana Simonton

This project focused on the High Point Terrace section of the Greater Memphis Greenline, a restored railroad line that has been converted into a linear park and runs through many areas of Midtown, including areas around Rhodes College. Analysis of various aspects of the High Point Terrace neighborhood, such as income, location, and age of residents of the neighborhood, along with the dynamics of the rail within the neighborhood, such as grade, visibility, and potential access points, reveal that this neighborhood is the ideal locale for the initial opening of the greenway.

### **The Business Climate in Hollywood Springdale**

Austin Horne

Katy Chambers

Leah Kaye

Becky Ferguson

We studied the problems that affect Hollywood-Springdale businesses around the intersection of Chelsea Avenue and Hollywood Street. We identified the most significant business-related problems, according to the business owners, and compiled the results in a format that is easy to both access and interpret. Survey questions included types of problems such as infrastructure, appearance, and crime. We found that crime-related issues as well as public policies regarding local governments were the most significant areas of concern, and we presented the results at the Hollywood Springdale Community Center for all of the business owners. These actions will lead to further awareness of the problems of the business community and will help in any effort to establish a plan for improving the overall business climate of Hollywood Springdale.

### **Debris Fields in Hollywood Springdale Area**

Justin Guthrie

Nathan Hulling

The theme of this presentation is to improve the Hollywood-Springdale area near the Rhodes community. The problem with this area is the numerous fields and empty lots within these communities that are littered with trash. The area is plagued with broken glass, rubber tires, condemned houses, and scattered trash. To assess and research this area, we drove through the community and recorded the addresses of those lots that needed to be cleaned up. Those addresses were then mapped using Geographic Information Systems (GIS). The GIS map was used by the fraternities of Rhodes to locate specified areas that were cleaned up. In the short term, our follow-up research shows the percentage of the original vacant lots that were cleaned up. The literature suggests that although litter and trash will reappear, it will be far less severe than currently.

**Biology II Laboratory Projects: Crayfish Behavior**

*Frazier Jelke 141w and 143w, beginning at 1:15 pm until 2:45 pm*

*Session Chairs: Rosanna Cappellato, Carolyn Jaslow and David Kesler, Department of Biology*

*This special session displays posters of research conducted over the last two weeks by the four sections of the Biology II introductory lab.*

**The Effects of Varying Water Temperatures on the Frequency of Agonistic Behavior in Male Crayfish**

Cody Haslett

Parker Long

Mandie Lutin

Sarah Mercer

Walker Senseman

Faculty Mentor: Rosanna Cappellato

Department of Biology

**A Comparison of Agonistic Behavior of Male and Female Crayfish on Sand and Charcoal**

Keller Bankston

Andrea Moore

Matt Tenore

Nicole Wellford

Faculty Mentor: Rosanna Cappellato

Department of Biology

**Shelter Preference in Crayfish**

Laura Groezinger

Kaveh Salehy

Natasha Jain

Leslie Samuelson

Faculty Mentor: Rosanna Cappellato

Department of Biology

**Crayfish Preference for a Darkened Habitat**

Oksana Balabanova

Lauren Marks

Arian Moshref

Louise Todd

Faculty Mentor: Rosanna Cappellato

Department of Biology



**The Effect of a Female's Presence on Male Crayfish Aggression**

Paul Lewis  
Elyssa Rubertino  
Jake McCart  
Margaret Tufton  
Faculty Mentor: Rosanna Cappellato  
Department of Biology

**Does Greater Pincer Size Affect Dominance in Male Crayfish?**

Mike Hathorn  
Michael Lallemand  
Jill McCall  
Megan McKenna  
Faculty Mentor: Rosanna Cappellato  
Department of Biology

**The Effect of Body Size on Territorial Behavior in Crayfish**

Tara Daniel  
Francesca Davis  
Cianna Pender  
Danielle Mueller  
Faculty Mentor: Rosanna Cappellato  
Department of Biology

**The Effect of Music on the Agonistic Behavior of Crayfish**

Daniel Lombardo  
Vivian McWilliams  
Kareem Mansur  
Britt Merritt  
Faculty Mentor: Rosanna Cappellato  
Department of Biology

**The Effect of a Female Crayfish on Male Crayfish Agonistic Behavior**

Elyssa Rubertino  
Paul Lewis  
Jake McCart  
Margaret Tufton  
Faculty Mentor: Rosanna Cappellato  
Department of Biology

**The Effect of Male Crawfish on Female Agonistic Behavior.**

Brittnay Chandler  
Orlando Croft  
Stuart Matin  
Jon Moot  
Lucas Routh  
Faculty Mentor: Rosanna Cappellato  
Department of Biology

**Temperature Effects of Crayfish Behavior**

Sarah Cassidy  
Ambreen Mardhani  
Deena Patel  
Karina Van Sickle  
Faculty Mentor: Rosanna Cappellato  
Department of Biology

**The Effect of Worm Odors on the Behavior of Crayfish**

Krissy Eron  
Brittaney Glazer  
Kimberly Godwin  
Kacie Ross  
Katie Slimp  
Faculty Mentor: Carolyn Jaslow  
Department of Biology

**Crayfish Light Preference in an Aqueous Environment**

Casey Derbes  
Grant Hayes  
Kelly Hoth  
Amy Ross  
Kelly Brier San Miguel  
Faculty Mentor: Carolyn Jaslow  
Department of Biology

**Male vs. Male and Male vs. Female: Is Crawfish Aggression Affected by Gender?**

Frances Benoist  
Amie Cahill  
Elizabeth Killion  
Emily Smith  
Faculty Mentor: Carolyn Jaslow  
Department of Biology

**The Effect of Size Variation on Aggressive Behavior and Bout Victories Among Male Crayfish**

Mary Landon Downs  
Jeremy Foon  
Nici Thomas  
Daniel Vanaman  
Faculty Mentor: Carolyn Jaslow  
Department of Biology

**Female Crayfish Agonist Behavior Due to Different Environments**

Matt Ricke  
Eddy Han  
Joe Williams  
Mark Scott

Faculty Mentor: Carolyn Jaslow  
Department of Biology

**Fifteen Crawfish Do Not Collectively Indicate Any Substrate Preference**

Brandon Chu  
Mark Oliver  
Susannah Schwartz  
Lindsey Tarbox  
Susan Wang  
Faculty Mentor: David Kesler  
Department of Biology

**The Effects of Shelter Size on Crayfish Preference**

Rebekah Mulloy  
Kristina Lynch  
Jennifer Ross  
Kelly McKenzie  
Faculty Mentor: David Kesler  
Department of Biology

**Substrate Color Does Not Affect Agonistic Behavior in Crayfish**

Warren Boone  
Chris Chugden  
Ryan Dagen  
Ben Halbrooks  
Amanda Lutzy  
Faculty Mentor: David Kesler  
Department of Biology

**The Effects of the Presence of a Shelter on the Frequency of Bouts and/or Agonistic Behaviors between two Crayfish**

Jessye Bobinis  
Stephanie Juchs  
Kara Clarke  
Laura Hamper  
Faculty Mentor: David Kesler  
Department of Biology

**The Effects of Substrate Preference on Agonistic Behavior Between Two Crayfish**

Zachary Gropper  
Jack Neill  
Luke Koehler  
Bryn Meredith  
Faculty Mentor: David Kesler  
Department of Biology

**Acknowledgement and Special Thanks to the following contributors:**

**Session Judges: Rhodes Faculty (F = Fine Arts, H = Humanities, N = Natural Sciences, S = Social Sciences)**

Erin Harmon (F)	Ellen Daugherty (F)	Diane Clark (F)
David Mason (F)	Timothy Powell (F)	Rebecca Rothman (F)
David Jilg (F)	Rocío Rodríguez del Río (H)	Alexandra Kostina (H)
Anna Dronzek (H)	Gail Streete (H)	Tom Cohen (H)
Chris Seaton (N)	Loretta Jackson-Hayes (N)	Ivaylo Ilinkin (N)
Shubho Banerjee (N)	Rosanna Capellato (N)	David Kesler (N)
Jay Blundon (N)	Mauricio Cafiero (N)	Annette Teepe (N)*
Anita Davis (S)	Bette Ackerman (S)	Hyun-Jeong Joyce Kim (S)
J. Peter Ekstrom (S)	Tom McGowan (S)	Chris Wetzel (S)
Daniel Arce (S)	Mark Smith (S)	Marshall Gramm (S)

\*working with student volunteers

**Session Judges: St. Jude Children's Research Hospital Mentors**

Monica Arroyo, Ph.D., Department of Structural Biology  
Stacy Donovan, Ph.D., Department of Developmental Neurobiology  
Steven Fenster, Ph.D., Department of Developmental Neurobiology  
Adam Gromley, Ph.D., Department of Genetics/Tumor Cell Biology  
David Vigerust, Ph.D., Department of Infectious Diseases

**Musicians: Rhodes Jazz Combo and Plenary Lecture pianist**

John Bass (Director)  
Josh Jefferies (trumpet)  
Matthew Horton (alto saxophone)  
Ryan Nall (guitar)  
Joe Noel (piano)  
Rene Orth (piano)  
Nate Smith (drums)  
Stephanie Swindle (bass)  
Charles White (tenor saxophone)  
Megan Norman (pianist for the Plenary Lecture reception)

**Special Session Organizers**

Tony Becker: Animal Behavior  
Carol Ekstrom: Environmental Research: Cypress Creek Oral Session  
Carol Ekstrom: Environmental Research: SWEEP events  
Michael Kirby & Carla Shirley: the Urban Studies Charrette  
Rosanna Cappellato, Carolyn Jaslow, David Kesler: Biology II Laboratory Posters  
Gary Lindquister: Molecular Biology: Bioinformatics Posters

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